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# Overview of maintenance on Cloud SQL instances

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[MySQL](https://cloud.google.com/sql/docs/mysql/maintenance) (<https://cloud.google.com/sql/docs/mysql/maintenance>) | [PostgreSQL](https://cloud.google.com/sql/docs/postgres/maintenance)

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## Beta

This feature is in a pre-release state and might change or have limited support. For more information, see the [product launch stages](https://cloud.google.com/products/#product-launch-stages) (<https://cloud.google.com/products/#product-launch-stages>).

This page explains how maintenance occurs on Cloud SQL instances, and how you can control the timing of maintenance. To get started, see [Finding and setting maintenance windows](https://cloud.google.com/sql/docs/sqlserver/set-maintenance-window) (<https://cloud.google.com/sql/docs/sqlserver/set-maintenance-window>).

## What are maintenance windows?

Cloud SQL instances need occasional updates to fix bugs, prevent security exploits, perform upgrades. After applying updates, Cloud SQL restarts the instances, which can cause a disruption in service. *Maintenance windows* are blocks of time when Cloud SQL schedules this maintenance to take place.

If you want to get notification of upcoming maintenance updates, you must do both of the following:

- [Set your preferred maintenance options on instances.](https://cloud.google.com/sql/docs/sqlserver/maintenance#preferred-windows)  
(<https://cloud.google.com/sql/docs/sqlserver/maintenance#preferred-windows>) You can control the day of the week and time when an instance receives updates.
- [Opt in to get notifications for when maintenance occurs.](https://cloud.google.com/sql/docs/sqlserver/maintenance#maintenance-notifications)  
(<https://cloud.google.com/sql/docs/sqlserver/maintenance#maintenance-notifications>) This helps you plan for disruptions.

If you do not specify a preferred window, disruptive updates can happen at any time, although they generally only occur every few months.

## How do you set preferred maintenance windows on instances?

You schedule maintenance at a selected day of the week and time, and the order that your instances are updated. You configure these options on an instance using the **Preferred window** and **Order of update** settings.

When you configure **Preferred window** for an instance, Cloud SQL does not initiate updates to that instance outside of the window. Maintenance occurs every few months and usually completes within a couple of minutes. It is guaranteed not to start outside your preferred window. Maintenance is not guaranteed to complete in the preferred window. Preferred windows are defined in UTC. As a consequence, Daylight savings time changes are not applied to preferred windows. You must reconfigure your preferred window to observe local time changes.

When you configure **Order of update**, it sets the relative timing of instance updates that might cause downtime. Timing options are **Any**, **Earlier**, or **Later**. Later instances receive updates the week after earlier instances. The earlier instances receive the exact same update as the later instances. Receiving an update on a single instance earlier lets you test your application with an update, before updating the rest of your instances.

The relative timing of updates is not observed between projects or regions. If you have instances with an earlier timing setting in a different project or different location (e.g., region) than your instances with a later timing setting, Cloud SQL makes no attempt to update the instances with the earlier timing setting first.

If you do not set the order of update, Cloud SQL chooses the timing of updates to your instance (within its preferred window, if applicable).

The **Order of update** setting does not affect the software version Cloud SQL applies to your instance.

## Are there design recommendations for handling maintenance shutdowns?

We recommend that you design your applications to deal with situations when your instance is not accessible for short periods of time, such as during a maintenance shutdown. To test the behavior of your application during a maintenance shutdown, [restart your instance](https://cloud.google.com/sql/docs/sqlserver/start-stop-restart-instance) (https://cloud.google.com/sql/docs/sqlserver/start-stop-restart-instance). In general, we recommend that you use only short-lived connections and exponential back-off for retrying rejected connections.

## How do I get maintenance notifications?

Notifications for maintenance are not sent out by default. If you want to receive maintenance notifications, you need to set the **Cloud SQL Maintenance Window** option in the Cloud Console **Communications** page, and select **ON** under **Email**. You can only receive notifications by email.

**Note:** You receive one notification per instance.

Maintenance notifications are set at the project level rather than on instances.

## Where do I find details about upcoming maintenance?

Maintenance notifications are sent out one week before maintenance is performed. To see if an instance is scheduled for update, look on the **Instance details** page. If there is upcoming maintenance, it is listed in the **Maintenance** pane, along with a date and time for maintenance. To view a list of instances scheduled for maintenance, go to the **ACTIVITY** window in the Cloud Console. Instances have the message **SQL Maintenance** and the date and time for upcoming maintenance.

## What happens if the maintenance event is cancelled?

If Cloud SQL cancels a maintenance event, you receive notification that maintenance is cancelled. In rare cases, it might not be possible for Cloud SQL to send a cancellation notification in advance. In this case, you are notified that maintenance was not applied, after the scheduled maintenance window has passed.

You will receive a new notification of upcoming maintenance when the maintenance event is rescheduled.

## Time-sensitive maintenance

While most maintenance operations observe the maintenance windows you define, critical service updates, such as patches for vulnerabilities that are time sensitive, might not. These updates roll out rapidly and Cloud SQL counts them as downtime against its SLA.

## How do I reschedule maintenance?

When you receive a maintenance notification, you have the option to change the maintenance window. For example, if you have a service release launching, you might want to reschedule the maintenance window for a few days before or after your launch. There are a few ways to reschedule a maintenance window:

- **Apply updates immediately.** You have the option to apply the updates to your instance immediately instead of waiting for the scheduled maintenance window.
- **Reschedule to another time.** You can postpone a scheduled maintenance event in two ways:
  - **Next available window.** This moves the maintenance window one week at a time, with a maximum of one rescheduled maintenance per event, per instance.
  - **Specific time.** This lets you choose any new time within one week of the originally scheduled maintenance.

If you want to reschedule a maintenance event, you must do so at least 24 hours before the maintenance event is originally scheduled.

You can reschedule maintenance on one or multiple instances in your project. On the **Instances** page, search for the instances you want to reschedule using name, IP, location, or custom labels. Select any subset of Cloud SQL instances to set a new maintenance window on several instances at once. On the **MAINTENANCE** window, you select **Reschedule** and choose whether to apply maintenance immediately or reschedule it to the next maintenance window or to a specific time that you choose.

If you opt to start maintenance immediately, generally, maintenance starts within five minutes.

Rescheduling maintenance defers maintenance of your instances to the next maintenance window or to a specific time that you choose. Additionally, you can manually trigger the maintenance at any time between now and the next maintenance window. Maintenance times cannot be changed more than once, including trying to apply changes immediately.

## What's next

- See how to [opt in to maintenance notifications](https://cloud.google.com/sql/docs/sqlserver/set-maintenance-window#opt-in) (https://cloud.google.com/sql/docs/sqlserver/set-maintenance-window#opt-in).
- See how to [set a maintenance window](https://cloud.google.com/sql/docs/sqlserver/set-maintenance-window#set-maintenance) (https://cloud.google.com/sql/docs/sqlserver/set-maintenance-window#set-maintenance).
- See how to [view maintenance notifications](https://cloud.google.com/sql/docs/sqlserver/set-maintenance-window#find-maintenance) (https://cloud.google.com/sql/docs/sqlserver/set-maintenance-window#find-maintenance).

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