

# Distribution Agent Troubleshooting deactivated or expired subscriptions

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## Issue

The customer is reporting that their subscription has been marked as deactivated or expired, or is about to be deactivated.

Typical error messages are:

*(pre-warning:)*

Error	Message
14160	One or more subscriptions has exceeded the threshold [%s:%s] for the publication [%s]. Check the status of subscriptions to this publication and change the expiration threshold value if necessary.

*(already too late:)*

Error	Message
14157	The subscription created by Subscriber '%s' to publication '%s' has expired and has been dropped.
18854	One or more subscriptions have been marked inactive. Drop and re-create all subscriptions for this node that are failing with this error.
20538	Replication: expired subscription dropped
21011	Deactivated subscriptions
21056	The subscription to publication '%s' has expired or does not exist.
21074	The subscription(s) have been marked inactive and must be reinitialized. NoSync subscriptions will need to be dropped and recreated.

From the Replication Monitor's "All Subscriptions" window, you can see a warning message showing the subscription status as "Expiring soon/Expired".

## Investigation

Subscription Expiration and Deactivation is a normal feature related to the metadata cleanup in Transactional Replication. The cleanup is necessary to keep the size of the Distribution database under control. It is removing transactions and commands from Distribution that are older than the cutoff datetime, whereas the cutoff is calculated from now() minus the retention period.

The cleanup implies that any Subscriber that wasn't able to synchronize within the metadata retention period will lose its unsynchronized data. If this happens, the subscription will be marked as deactivated or expired.

Please see the [More Information](#) section below for further details.

## Possible causes

1. The replication agents were failing for longer than the retention period.
2. There was a severe performance issue and the Distribution Agent was falling behind for longer than the retention period.
3. One of the replication agents was stuck in a retry loop; it never reported any errors but was still unable to progress. See article [Replication Agent is not failing but retrying forever](#) for further details.
4. *There might be other reasons - please add a comment below if you encounter further scenarios.*


## Troubleshooting steps

In order to identify the cause of deactivation or expiration, you need to find out why the replication agents were not able to replicate changes within the retention period:

1. Check job history and agent history for any errors.

2. Check the retention period in the Distribution properties. If it is set to a low number like 3 hours, then this indicates that if the subscriber does not synchronize in 3 hours, the distribution cleanup agent will truncate the commands tables in distribution and hence the subscriber will be marked as deactivated. See article [How to configure publication and distribution retention](#) for further details.
3. If there are no immediate errors, check the performance characteristics of the replication agents. See article [Performance Troubleshooting Initial Steps](#) to get started.


## Mitigation

1- If you have identified any misconfiguration or error, fix these issues first before reinitializing the subscription(s). Only then [reinitialize the subscription](#) , otherwise you might run into the same issue again. If a new snapshot is required, you might want to start the Snapshot Agent job before taking further troubleshooting steps; the snapshot can be created in the background while you continue troubleshooting. Check with the customer how long the snapshot agent usually takes so that you can give it the right priority.

2- Do not set the subscriptions to never expire (a value of 0 for @retention), because this would prevent any metadata cleanup. The Distribution database would grow until it takes up all storage space of the Managed Instance.

3- You might try to reset the subscription status from status `deactivated` back to `active` - but this will only work if the pending changes beyond the retention period (default 72 hours) haven't been cleaned up yet, meaning that the `Distribution clean up: Distribution` job hasn't run:

```
if exists (select 1 from distribution..MSsubscriptions where status = 0)
begin
UPDATE distribution..MSsubscriptions
SET STATUS = 2
WHERE publisher_id = '<publisher_id -- integer -->'
      AND publisher_db = '<publisher database name>'
      AND publication_id = '<publication_id -- integer -->'
      AND subscriber_id = '<subscriber_id -- integer -->'
      AND subscriber_db = '<subscriber database name>'
      AND status = 0
end
```

4- You can [Set Thresholds and Warnings in Replication Monitor](#)  for warnings about subscription deactivation. If the specified threshold is met or exceeded, the subscription status is displayed as "Expiring soon/Expired".

5- Disabling the `Expired subscription clean up job` or `Distribution clean up: Distribution` job will not help, because it will cause overall system stability issues later due to metadata bloat. Disabling the `Distribution clean up: Distribution` job however might be a valid troubleshooting step if you are close to reaching the retention period and need more time to fix an active issue with the replication agents.

## More information

The article [Subscription Expiration and Deactivation](#)  explains the details behind this feature:

Subscriptions can be deactivated or can expire if they are not synchronized within a specified retention period. The action that occurs depends on the type of replication and the retention period that is exceeded. To set retention periods, see [Set the Expiration Period for Subscriptions](#), [Set the Distribution Retention Period for Transactional Publications \(SQL Server Management Studio\)](#), and [Configure Publishing and Distribution](#).

Transactional replication uses the maximum distribution retention period (the @max\_distretention parameter of sp\_adddistributiondb (Transact-SQL)) and the publication retention period (the @retention parameter of sp\_addpublication (Transact-SQL)):

- If a subscription is not synchronized within the maximum distribution retention period (default of 72 hours) and there are changes in the distribution database that have not been delivered to the Subscriber, the subscription will be marked deactivated by the Distribution clean up job that runs on the Distributor. The subscription must be reinitialized.
- If a subscription is not synchronized within the publication retention period (default of 336 hours), the subscription will expire and be dropped by the Expired subscription clean up job that runs on the Publisher. The subscription must be recreated and synchronized.

If a push subscription expires, it is completely removed, but pull subscriptions are not. You must clean up pull subscriptions at the Subscriber. For more information, see [Delete a Pull Subscription](#).

Deactivating the subscription and having to reinitialize might seem harsh for not being able to run the Distribution Agent. But normally, if you cannot synchronize transactions on a busy system within 72 hours, the backlog might have increased so much that the Distribution Agent might never catch up again. In that case you are probably better off by sending a new snapshot to your subscribers anyway.

## Public Documentation Reference

[Subscription Expiration and Deactivation](#) 

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