Replication Agent is not failing but retrying forever

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Issue

The customer reports that their Transactional Replication is no longer replicating changes to the subscribers. On further investigation, you notice that either the Log Reader or the Distribution Agents have not failed, but are retrying after encountering an error. It has been doing this for quite some time, but because the agent is retrying, it was not marked as failed, and no red "X" was bubbled up in the Replication Monitor.

The main symptom is that a simple error condition may cause a presumed "agent hang". The affected replication agent is busy with its retry attempts and never comes around to reporting the actual cause of error to the user interface and alert system.

Investigation

The expected behaviour would have been that the replication agent is retrying for a limited number of attempts, for example 10 or 20 times, and is then failing with the appropriate error message.

The retries are configured through the job step of the corresponding replication agent job. Please open the `Job Activity Monitor` in SSMS, double-click the affected agent job, and open the `Run agent` step. Click on the `Advanced` tab and check the `Retry attempts` field:
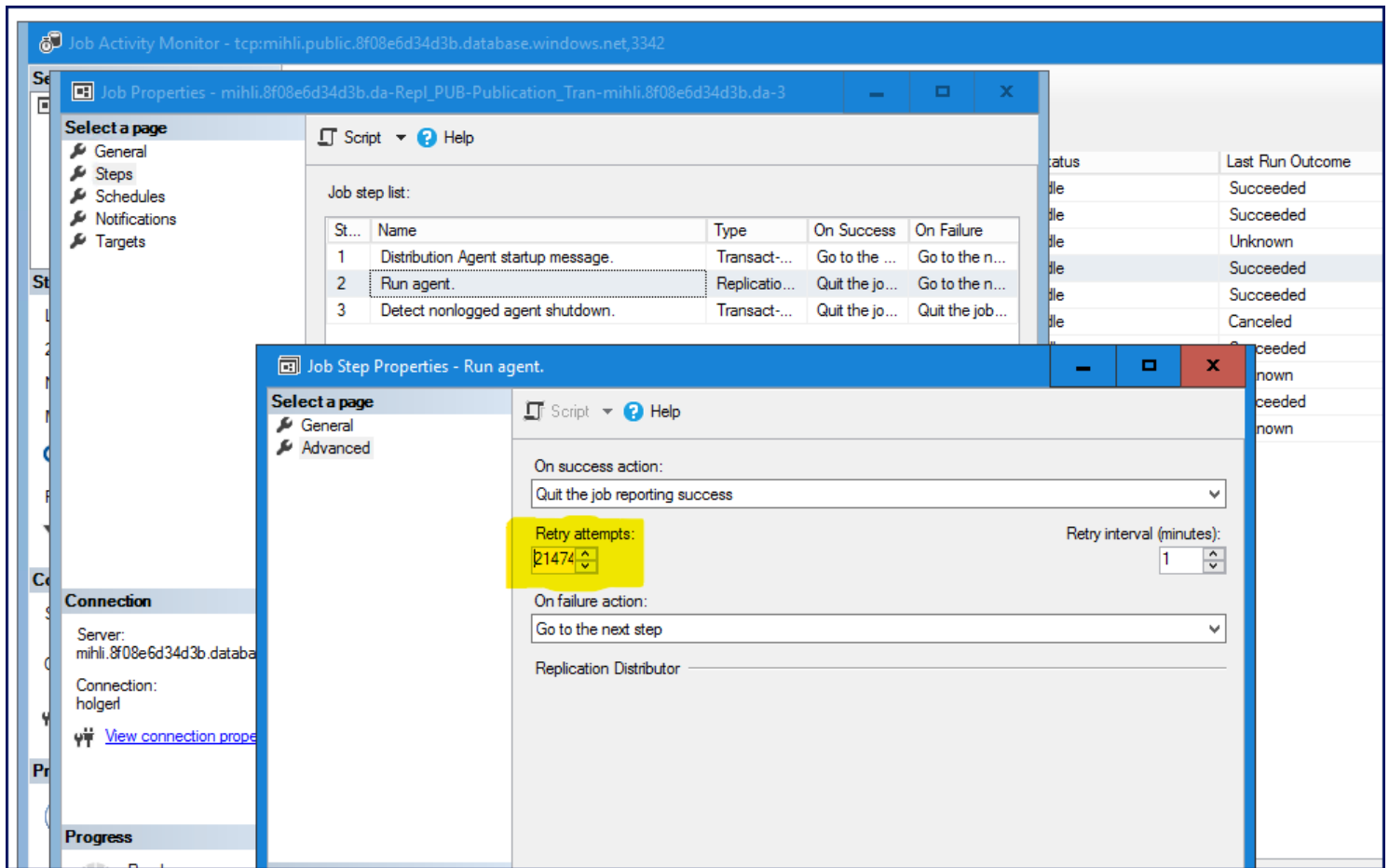
The expected default value is 10, but under certain scenarios, it might have been inadvertedly set to the value of 2147483647. If the retry interval is the default of 1 minute, then this is the equivalent of 2.147.483.647 * 1 minute = 35.791.394 hours = 1.491.308 days = 4085 years.

Alternatively, you can run the following query to identify any SQL Agent job affected by this issue:

```
Select * from msdb.dbo.sysjobsteps
where retry_attempts = 2147483647
```

Mitigation

On the `Advanced` tab of the `Run agent` step, set the `Retry attempts` to 10 and save the settings. If the agent job was still running, stop and restart the job so that it picks up the changed settings. Do not forget to look into the reason why the replication agent was failing.

More Information

How does this impact Replication?

If a replication agent is configured for continuous execution (schedule name: "Start automatically when SQL Server Agent starts") and then fails, it will not report the error back to the SQL Agent Service. Instead it will wait 1 minute, then try the operation again for the configured number or retries - which is 4085 years. During this time, any alerts placed with SQL Agent for "job failure" will not get called.

For example, if the Distribution Agent, running continuously, is unable to deliver data because of errors 20598 or 2627, the agent will go into an infinite retry logic because these errors do not heal by itself:

> error 20598: The row was not found at the Subscriber when applying the replicated command.
> error 2627: Violation of PRIMARY KEY constraint 'PK__A'. Cannot insert duplicate key in object 'dbo.A'.

If undetected, the Distribution Agent will stay in retry mode for 72 hours until the Distribution Cleanup job removes the "cached" transactions from the distribution database. At this point, the Distribution Agent will no longer have the data needed to "catch up" the Subscriber. As result, the Subscriber will be marked "inactive" and post the following error in the `MSrepl_errors` table in the Distribution database:

> Error 18854
> One or more subscriptions have been marked inactive. Drop and re-create all subscriptions for this node that are failing with this error.

What is the cause of the excessive number of retries?

This issue was originally reported in 2010 for an on-premise Merge replication. The customer had changed the schedule of the Merge Agent job from running every 10 minutes to continuous (schedule name: "Start automatically when SQL Server Agent starts"). They noticed that the number of retry attempts was implicitly changed by this step.

The root cause is a defect in the change code. If you add the subscription (e.g. `sp_addsubscription`), the initial number of retries is 10. But if you use a stored procedure to change the schedule of the agent job to run in Continuous mode, the Run Agent step will be configured with the excessive number of retries. This might occur through any stored procedure that is using the parameter `frequency_type` (e.g. through `sp_addpushsubscription_agent`, `sp_changesubscriber`), by setting `frequency_type` to value 64 = Autostart.

Although this defect had been reported in 2010, it has never been fixed and it still applies to Managed Instance.

How good have you found this content?

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