Distribution Agent failing on BCP IN operation

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Issue

The customer has configured Transactional Replication and has created the initial snapshot. When they run the Distribution Agent to apply the snapshot to the Subscriber, the agent is failing to bulk copy the data into the Subscriber table.

Error details from the Distribution Agent history:

```
(...)
2022-08-31 07:40:12.996 Repl Agent Status: 3
2022-08-31 07:40:13.011 Bulk copying data into table 'tablearticle1'
2022-08-31 07:40:13.011 Repl Agent Status: 3
2022-08-31 07:40:13.011 Disconnected from Azure Storage '\\storageaccount.file.core.windows.net\snapshots' wit
2022-08-31 07:40:13.011 Repl Agent Status: 3
2022-08-31 07:40:13.011 Agent message code 20037. The process could not bulk copy into table '"dbo"."tablearti
2022-08-31 07:40:13.011 Repl Agent Status: 6
2022-08-31 07:40:13.027 ErrorId = 128847, SourceTypeId = 2
ErrorCode = '20037'
ErrorText = 'The process could not bulk copy into table '"dbo"."tablearticle2"'.'
2022-08-31 07:40:13.043 Adding alert to msdb..sysreplicationalerts: ErrorId = 128847,
Transaction Seqno = 0000262c00000300000800000007, Command ID = 47
Message: Replication-Replication Distribution Subsystem: agent <distribution-agent-name>-290 failed. The proce
(...)
Source:
Number:  20253
Message: To obtain an error file with details on the errors encountered when initializing the subscribing tabl
2022-08-31 07:40:13.058 Repl Agent Status: 3
2022-08-31 07:40:13.058 ErrorId = 128847, SourceTypeId = 0
ErrorCode = '20253'
ErrorText = 'bcp "subscriberdatabase"."dbo"."tablearticle2" in "\\storageaccount.file.core.windows.net\snapsho
2022-08-31 07:40:13.058 Category:NULL
Source:
Number:  20253
Message: bcp "subscriberdatabase"."dbo"."tablearticle2" in "\\storageaccount.file.core.windows.net\snapshots\u
2022-08-31 07:40:13.058 Repl Agent Status: 3
2022-08-31 07:40:13.058 OLE DB Subscriber 'FQDN.4a5ca3331307.database.windows.net': exec dbo.sp_MSupdatelastsy
2022-08-31 07:40:13.074 Disconnecting from OLE DB Subscriber 'FQDN.4a5ca3331307.database.windows.net'
2022-08-31 07:40:13.074 Disconnecting from OLE DB Subscriber 'FQDN.4a5ca3331307.database.windows.net'
```

If you try to test the `bcp` command that is provided in the error message, it will fail as well but likely for a different reason (usually permission issues or syntax errors).

Investigation / Analysis

When the Snapshot Agent scripts out the published source table, it establishes the required columns with their data types in the correct order. This guarantees that if the destination table gets created through the snapshot scripts at the Subscriber, the bulk insert (BCP IN) operation will succeed.

If the BCP IN operation is failing, it usually means that the table schema at the Subscriber database is different from what the Snapshot Agent expected it to be.

The troubleshooting includes the following steps:

- Compare the table schema of Publisher and Subscriber table and check if they are different in number and/or order of columns.
- Script out the publication and check the `sp_addarticle` command parameter `@pre_creation_cmd` if it is set to anything else than "drop". To create the script, right-click on the publication in SSMS and select "Generate Scripts...".

A good indicator for the cause of the issue is if you see `@pre_creation_cmd = N'none'` as in the following example - it implies that the Subscriber table was not created by the snapshot script:

```
use [publisherdatabase];
exec sp_addarticle @publication = N'publicationname',
@article = N'tablearticle2', @source_owner = N'dbo', @source_object = N'tablearticle2', @type =
N'logbased', @description = N'', @creation_script = N'',
@pre_creation_cmd = N'none', @schema_option = 0x000000010200008D,
@identityrangemanagementoption = N'manual', @destination_table = N'tablearticle2', @destination_owner
= N'dbo', @status = 8, @vertical_partition = N'false',
@ins_cmd = N'CALL [dbo].[usp_tablearticle2_Replication_Insert]', @del_cmd = N'NONE', @upd_cmd =
N'NONE';
```

In this specific case, it turned out that both source and destination tables had a different schema. The Publisher table had many more columns than the Subscriber table but the article definition didn't have a vertical column filter (`*@vertical_partition = N'false'`). The BCP IN operation was therefore trying to insert data into a table that had less columns.

Mitigation

- If both Publisher and Subscriber tables are supposed to be identical, then make sure that both sides have the same schema. Either change `pre_creation_cmd` to value "drop" and let the destination table be created through the snapshot, or change the Subscriber table in a way that columns and column order are identical.
- If the Publisher is supposed to have more columns than the Subscriber, then add a column filter to the article. Use `sp_addarticle ... @vertical_partition = N'true'` and call sp_articlecolumn ⧉ to add or drop a column from the article definition. See the example ⧉ for more details.
- It is not supported that the Subscriber table has more columns than the Publisher table. There is no way to reflect this difference within Transactional Replication.

How good have you found this content?