

Data Sync - Health Checker

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Azure SQL Data Sync Health Checker (a script that can help a lot with DSS cases).

This is now an open source project hosted at <https://github.com/Microsoft/AzureSQLDataSyncHealthChecker> 

I've worked on a lot of DSS cases and I can say that it's a challenging topic, we get a lot of different issues and we get a lot of cases where customers get other issues after the first one is fixed.

We need to learn a few things before completely understand how it works all together. We also may need several interactions with customers during the troubleshooting.

In order to save troubleshooting time and reduced the number of interactions needed I've developed the **Azure SQL Data Sync Health Checker** (former DSS Validator for the ones that played with it).

(This project started a long time ago when @Roberto and @JM were in Lisbon.)

This PowerShell script basically will check if all the metadata of a member/hub is in place and also validate the scopes against the information we have on the sync metadata database (among other validations). This script will not make any changes, will just validate data sync and user objects. It will also gather some useful information for faster troubleshooting.

I feel this can be useful but for that **I need your help** getting familiar with it, using it with customers and providing feedback.

Please run this on your own sync groups and let me know what you think.

Use it with customers and provide me feedback (about when it helped and when it didn't). This is very important so we can all leverage and evolve this as much as possible.

Here are some information and validations it does already:

General information

- How many sync groups, sync group members and sync agents found in this sync metadata database.
- Scopes in Sync DB for the member database
(scopename, SyncGroupName, MemberName, SyncDirection, State, HubState, JobId, Messages).
- Scopes in member database (sync_scope_name, scope_config_id, scope_status, scope_local_id).

- Job information in case some are still running
(JobId,IsCancelled,JobType,TaskCount,CompletedTaskCount,MessageId,MessageType,ExecTimes,ResetTimes)

Validations for each scope:

- Tables
 - Column (Type, Size, Nullable)
 - Missing columns in the table VS scope
 - Not nullable columns not included in the sync group
- Tracking Tables
- Triggers
- Stored Procedures
- FK Dependencies (of tables that are not in the sync group)

Validations (general)

- Tracking Table leftovers
- Trigger leftovers
- Stored Procedure leftovers
- Provision Marker (leftovers and missing records)
- Circular References in the database

It generates a leftovers cleanup script and Warnings summary.

What will you get with Data Sync Health Checker

Outputs

- Sync DB used by customer while running the script
- Sync groups, members and agent counts
- In case there are missing tables (sync groups, members or agents) in SyncDB
- Scopes in Sync DB for the hub/member
- Job information in case any job exists
- Hub/member database used by customer while running the script
- Scopes in the hub/member

Validations:

- Scope being validated
- Column data types, size and nullable
- Tracking tables, triggers and stored procedures existence
- Foreign Keys referencing tables not used in sync group
- Tracking Table leftovers
- Trigger leftovers
- Stored Procedure leftovers

- Provision Marker validations
- Circular References detection
- Leftovers summary (Cleanup script)
- Warnings summary

Monitoring

Outputs

SyncDB used by customer while running the script
Connecting to SyncDB vnetserver.database.windows.net/syncdb

Sync groups, members and agent counts
3 sync groups / 4 sync group members / 2 sync agents found in this sync metadata database

In case there are missing tables (sync groups, members or agents) in SyncDB

Closing connecting to SyncDb...
Exception calling "ExecuteReader" with "0" argument(s): "Invalid object name 'dss.syncgroup'."

Scopes in SyncDB for the hub/member

Getting scopes in SyncDB for this member database...
1 members found in this sync metadata database

scopename	SyncGroupName	MemberName	SyncDirection	State	HubState	JobId
-----	-----	-----	-----	-----	-----	-----
F8DDD928-195B-49D0-A73C-4AFF508B67A6	Test2SG	Test2	Upload	SyncInProgress	Provisioned	6142473



Job information in case any job exists

JobId	IsCancelled	JobType	TaskCount	CompletedTaskCount	MessageId
-----	-----	-----	-----	-----	-----
61424734-5708-499c-995c-a5514c0d2e8c	False	2	1		0 758eeaff-00f6-41d7-b957-



Hub/member database used by customer while running the script
Connecting to Member vitomaz.database.windows.net/Tests2

Scopes in the hub/member

Getting scopes in this member database...
1 scopes found in member

sync_scope_name	scope_config_id	scope_status	scope_local_id
-----	-----	-----	-----
F8DDD928-195B-49D0-A73C-4AFF508B67A6	ed652d7a-b2f0-4a62-b4d2-7c0687dedc7f	C	1

Validations:

Scope being validated

Validating scope ed652d7a-b2f0-4a62-b4d2-7c0687dedc7f

Column data types, size and nullable

```
[dbo].[myTable].[myTableID] @P_1 Type(int):OK Size(4):OK
[dbo].[myTable].[Id2] @P_2 Type(uniqueidentifier):OK Size(16):OK Nullable(true):OK
[dbo].[myTable].[Name] @P_3 Type(varchar):OK Size(255):OK Nullable(true):OK
[dbo].[myTable].[Address] @P_4 Type(varchar):OK Size(255):OK Nullable(true):OK
[dbo].[myTable].[A] @P_5 Type(varchar):OK Size(max):OK Nullable(true):OK
```

Or, if invalid scope

```
WARNING: [DataSync].[scope_config_dss].[config_id] 0a328149-7366-4170-a53f-6f9184fd0ede should be a leftover.
WARNING: [DataSync].[scope_info_dss].[scope_local_id] 4 should be a leftover.
WARNING: [DataSync].[provision_marker_dss] WHERE [owner_scope_local_id] = 4 and [object_id] = 1365579903 (
WARNING: [DataSync].[provision_marker_dss] WHERE [owner_scope_local_id] = 4 and [object_id] = 1685581043 (
```

Or, if missing

```
WARNING: [dbo].[MasterTable2].[ID] is missing in this database but exist in sync group schema, maybe preventin
```

Tracking tables, triggers and stored procedures existence

```
Tracking Table [DataSync].[myTable_dss_tracking] Exists
Trigger [dbo].[myTable_dss_insert_trigger] Exists
Trigger [dbo].[myTable_dss_update_trigger] Exists
Trigger [dbo].[myTable_dss_delete_trigger] Exists
Procedure [DataSync].[myTable_dss_selectchanges_ed652d7a-b2f0-4a62-b4d2-7c0687dedc7f] Exists
Procedure [DataSync].[myTable_dss_selectrow_ed652d7a-b2f0-4a62-b4d2-7c0687dedc7f] Exists
```

Foreign Keys referencing tables not used in sync group

No FKs referencing tables not used in sync group detected

Or

(sample message to be added)

Tracking Table leftovers

There are no Tracking Table leftovers

Or

```
WARNING: Tracking Table [DataSync].[DetailTable1_dss_tracking] should be a leftover.
WARNING: [DataSync].[provision_marker_dss] WHERE [owner_scope_local_id] = 0 and [object_id] = 1685581043 ( De
```

Trigger leftovers

There are no Trigger leftovers

Or

(sample message to be added)

Stored Procedure leftovers

There are no Procedure leftovers

Or

```
WARNING: Procedure [DataSync].[DetailTable1_dss_bulkdelete_0a328149-7366-4170-a53f-6f9184fd0ede] should be a l
WARNING: Procedure [DataSync].[DetailTable1_dss_bulkinsert_0a328149-7366-4170-a53f-6f9184fd0ede] should be a l
WARNING: Procedure [DataSync].[DetailTable1_dss_bulkupdate_0a328149-7366-4170-a53f-6f9184fd0ede] should be a l
WARNING: Procedure [DataSync].[DetailTable1_dss_delete_0a328149-7366-4170-a53f-6f9184fd0ede] should be a lefto
WARNING: Procedure [DataSync].[DetailTable1_dss_deletemetadata] should be a leftover.
WARNING: Procedure [DataSync].[DetailTable1_dss_insert_0a328149-7366-4170-a53f-6f9184fd0ede] should be a lefto
WARNING: Procedure [DataSync].[DetailTable1_dss_insertmetadata] should be a leftover.
WARNING: Procedure [DataSync].[DetailTable1_dss_selectchanges_0a328149-7366-4170-a53f-6f9184fd0ede] should be
WARNING: Procedure [DataSync].[DetailTable1_dss_selectrow_0a328149-7366-4170-a53f-6f9184fd0ede] should be a le
WARNING: Procedure [DataSync].[DetailTable1_dss_update_0a328149-7366-4170-a53f-6f9184fd0ede] should be a lefto
WARNING: Procedure [DataSync].[DetailTable1_dss_updatemetadata] should be a leftover.
```

Provision Marker validations

ValidateProvisionMarker did not detect any issue

Or

WARNING: [DataSync].[provision marker_dss] WHERE [owner_scope_local_id] = 0 and [object_id] = 1685581043 (DetailTable1) should be a leftover.

Circular References detection

ValidateCircularReferences did not detect any issue

Or

```
WARNING: ValidateCircularReferences found some circular references in this database:
- dbo.Contact | dbo.Account | FK__Contact__Account__76619304 | FK__Account__Primary__7755B73D
- dbo.Account | dbo.Contact | FK__Account__Primary__7755B73D | FK__Contact__Account__76619304
```

Check same table name in multiple schemas

ValidateTableNames did not detect any issue

Or

```
WARNING: ValidateTableNames found some tables names in multiple schemas in this database:
- Persons9995 seems to exist in multiple schemas!
```

Check invalid object names

ValidateObjectNames did not detect any issue

Or

```
WARNING: ValidateObjectNames found some issues:
- HumanResources | vJobCandidate | Addr.Loc.City
- HumanResources | vJobCandidate | Addr.Loc.CountryRegion
- HumanResources | vJobCandidate | Addr.Loc.State
- HumanResources | vJobCandidate | Addr.PostalCode
- HumanResources | vJobCandidate | Addr.Type
- HumanResources | vJobCandidate | Name.First
```

Detect computed columns

DetectComputedColumns did not detect any computed column

Or

INFO: Computed columns detected (they cannot be part of sync schema):

- [dbo].[Products2].[InventoryValue]
- [dbo].[Products2].[RetailValue]

Detect provisioning issues

WARNING: Table201_dss_tracking exists but the corresponding user table does not exist! this maybe preventing p

Leftovers summary (Cleanup script)

NO LEFTOVERS DETECTED!

OR

```
-- *****
-- *****
--LEFTOVERS CLEANUP SCRIPT : START
--Only applicable when this database is not being used by any other sync group in other regions and/or subscri
-- *****
DELETE FROM [DataSync].[scope_config_dss] WHERE [config_id] = '0a328149-7366-4170-a53f-6f9184fd0ede'
GO
DELETE FROM [DataSync].[scope_info_dss] WHERE [scope_local_id] = '4'
GO
DELETE FROM [DataSync].[provision_marker_dss] WHERE [owner_scope_local_id] = 4 and [object_id] = 1365579903 --
GO
DELETE FROM [DataSync].[provision_marker_dss] WHERE [owner_scope_local_id] = 4 and [object_id] = 1685581043 --
GO
Drop Table [DataSync].[DetailTable1_dss_tracking];

. . .

-- *****
--LEFTOVERS CLEANUP SCRIPT : END
-- *****
```

Warnings summary

NO ERRORS DETECTED!

Or

```
*****
      WARNINGS SUMMARY
*****
WARNING: ValidateCircularReferences found some circular references in this database:
- dbo.Contact | dbo.Account | FK__Contact__Account__76619304 | FK__Account__Primary__7755B73D
- dbo.Account | dbo.Contact | FK__Account__Primary__7755B73D | FK__Contact__Account__76619304
```

Monitoring

Sometimes it's hard to identify if a sync is really running, what is doing at the moment or if it's really stuck.

In version 3.2 I've introduced a monitoring capability (thank you Ricardo Marques for brainstorming with me on this).

Monitoring will let us know which stored procedures have run since the last monitoring check like:

What	LastExecutionTime	ExecutionCount
----	-----	-----
Persons61_dss_selectchanges_4a7d04ac-c4d1-4261-a0c1-c38bc9db0d7b	29/05/2018 10:48:06	20

It will also let us know what is running at the moment like:

Session	Status	Command	CPUTime	TotalTime	What
-----	-----	-----	-----	-----	-----
118	suspended	WAITFOR	0	10431	[DataSync].[Persons61_dss_selectchanges_a4a7f8e4-557c-48ef-8a5f-32



Here is a complete example of both scenarios:

```
*****
MONITORING
*****
Connecting to Hub vnetserver.database.windows.net/vnetdb
Connecting to Member vitomaz.database.windows.net/DSSTest1A
Monitoring ( 2018-05-29 10:47:31 )...
Monitoring ( 2018-05-29 10:47:46 )...
Monitoring ( 2018-05-29 10:48:01 )...
Hub Monitor ( 2018-05-29 10:48:01 ): new records:

What                                         LastExecutionTime  ExecutionCount
----                                         -
Persons61_dss_selectchanges_4a7d04ac-c4d1-4261-a0c1-c38bc9db0d7b 29/05/2018 10:48:06      20
Persons61_dss_selectchanges_7d1c274d-a614-4816-ace5-a23d80beed66 29/05/2018 10:48:10      20

Member Monitor ( 2018-05-29 10:48:01 ): new records:

What                                         LastExecutionTime  ExecutionCount
----                                         -
Persons61_dss_updatemetadata                29/05/2018 10:48:07      146
Persons61_dss_bulkupdate_a4a7f8e4-557c-48ef-8a5f-32a2644642e1 29/05/2018 10:48:06      19
Persons61_dss_update_a4a7f8e4-557c-48ef-8a5f-32a2644642e1     29/05/2018 10:48:07     146
Persons61_dss_selectrow_a4a7f8e4-557c-48ef-8a5f-32a2644642e1   29/05/2018 10:48:07     146

Member Monitor running ( 2018-05-29 10:48:01 ): new records:

Session Status  Command CPUTime TotalTime What
-----
118 suspended WAITFOR          0    10431 [DataSync].[Persons61_dss_selectchanges_a4a7f8e4-557c-48ef-8a5f-32

Monitoring ( 2018-05-29 10:48:16 )...
Member Monitor running ( 2018-05-29 10:48:16 ): new records:

Session Status  Command CPUTime TotalTime What
-----
118 suspended WAITFOR          0    25824 [DataSync].[Persons61_dss_selectchanges_a4a7f8e4-557c-48ef-8a5f-32

Monitoring ( 2018-05-29 10:48:31 )...
Member Monitor running ( 2018-05-29 10:48:31 ): new records:

Session Status  Command CPUTime TotalTime What
-----
118 suspended WAITFOR          0    41189 [DataSync].[Persons61_dss_selectchanges_a4a7f8e4-557c-48ef-8a5f-32
```

Monitoring is controlled by:

```
$MonitoringEnabled = $true #Set as $true or $false
$MonitoringIntervalInSeconds = 60
```

How good have you found this content?

