



Migration of a Process Historian database

SIMATIC PCS 7

<https://support.industry.siemens.com/cs/ww/en/view/66579062>

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Warranty and liability

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Table of contents

Warranty and liability	2
1 Introduction	4
1.1 Overview	4
1.2 HW configuration	5
1.2.1 Existing plant configuration	5
1.2.2 Target plant configuration	6
1.3 Prerequisite	7
1.4 General workflow	8
2 Analyzing existing database	9
2.1 Check the storage paths in the existing database	9
2.2 Check the security settings in the existing database	13
3 Creating database backup	15
3.1 Preparation	15
3.2 Procedure	19
4 Restore database with new data distribution	25
4.1 New database distribution	25
4.2 Procedure	25
5 Using Notepad++ for SQL string manipulation	37
6 Appendix	40
6.1 Service and Support	40
6.2 Links and Literature	41
6.3 Change documentation	41

1 Introduction

1.1 Overview

It could happen that a plant is rising over the lifecycle. If a plant is increasing, the amount of stored variables on a Process Historian is most probably also increasing. In such a situation there could be a need to exchange the Process Historian hardware, because the existing hardware is not suitable to carry the tag and alarm load.

In order to create a better read and write performance, it is necessary to distribute the database over a set of disks/RAID systems.

In this document the existing system is configured as a combined Process Historian and Information Server. We are moving the Process Historian database from the existing hardware to the new hardware.

The Information Server remains on the existing system. This is the preferred way of exchanging a combined PH/IS.

The target configuration is a dedicated PH and IS system. In this situation the customer needs to buy a new Information Server basic license, if the customer has a license for a combined PH/IS.

Used Software

This description has been created and tested with PH 2014 SP2 **Update 2**.

Needed Knowledge

One needs to be familiar with the Process Historian and the SQL Server Management Studio, in order to move the Historian Storage database to a new Hardware.

If this knowledge isn't available, we recommend ordering a SIEMENS field service.

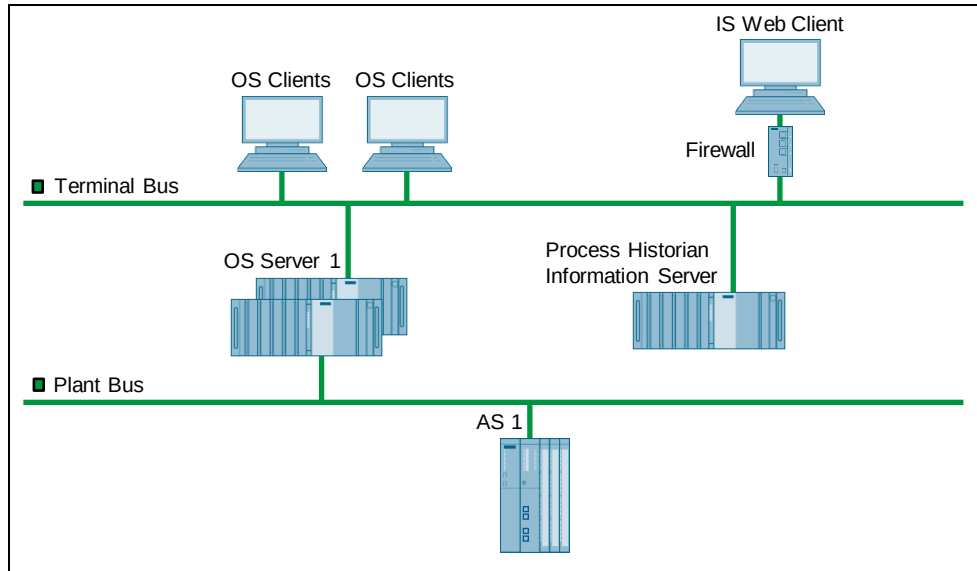
Prerequisite

It is a must to use PH 2014 SP2 **Update 2** or higher in order to move the database in the described way. Using PH 2014 SP2 **Update 2** or higher, no manually changes in the database are necessary.

1.2 HW configuration

1.2.1 Existing plant configuration

This configuration is used as an example for the existing plant configuration:



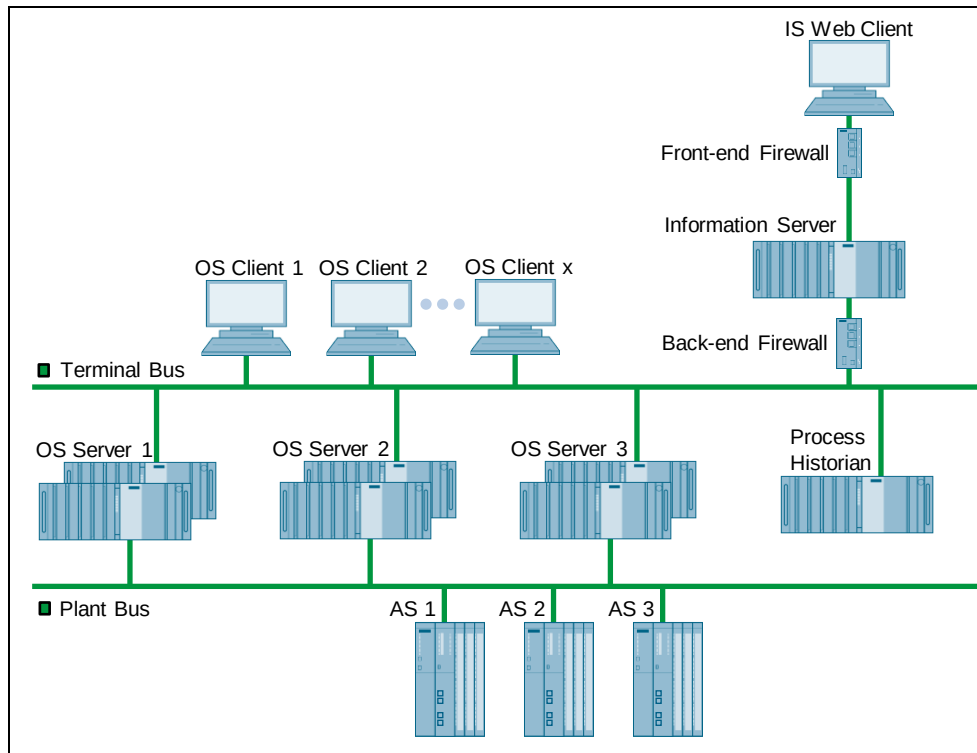
Existing Process Historian hardware

This is the PH hardware configuration used in the existing plant. .

Basics			
Platform	IPC 847D		
Processor	Xeon E3-1268L v3 (4C/8T, 2,30 GHz, 8 MByte Cache, TB, VT-d, AMT)		
RAM	32 GB, ECC		
Distribution	Storage technology	Storage capacity (in total)	Number & capacity of hard disks
operating system + transaction log file	single SSD	240 GB	1 x 240 GB
tags + alarms + common data (complete PH DB)	RAID 5	2 TB	3 x 1 TB

1.2.2 Target plant configuration

This configuration is used as an example for the target plant configuration. The existing plant configuration will be migrated into this plant configuration.



Target Process Historian hardware

This is the PH hardware configuration used in the target plant.

Basics			
Platform	Fujitsu Primergy RX2560 M1 with Windows Server 2012 R2, Standard Edition		
Processor	Intel® Xeon® processor E5-2643v3 (6C/12T, 3.40 GHz, TLC: 20 MB, Turbo: 3.60 GHz, 9.6 GT/s, Mem bus: 2,133 MHz, 135 W, AVX Base 2.80 GHz, AVX Turbo 3.40 GHz)		
RAM	64 GB, ECC		
Distribution	Storage technology	Storage capacity (in total)	Number & capacity of hard disks
operating system	Raid 1, 2.5-inch, SAS 12Gb/s	300 GB	2 x 300 GB
transaction log file	Raid 1, 2.5-inch, SAS 12Gb/s	600 GB	2 x 600 GB
alarms	Raid 1, 2.5-inch, SAS 12Gb/s	600 GB	2 x 600 GB
tags	Raid 10, 2.5-inch, SAS 12Gb/s	3.6 TB	6 x 1.2 TB

NOTE

This target hardware is not the general recommended HW configuration. It is a special hardware configuration in order to move the database with help of a database backup and restore.

1.3 Prerequisite

The following points are prerequisites, because this is the most efficient way to exchange the hardware.

- PH 2014 SP2 **Update 2** or higher
- Both Process Historian installations are of same version
- New Process Historian computer name = Old Process Historian computer name
- New Process Historian administrator = Old Process Historian administrator (Windows user)
- New Process Historian IP address= Old Process Historian IP address

NOTICE

It is not possible to run two computers with the same computer name and/or IP address in the same network. Therefore you need to disconnect the old PH machine from the network before connecting the new installed PH to the network.

NOTICE

It is not possible to change the computer name after the Process Historian software is installed.

1.4 General workflow

NOTICE Check available free disk space of C drive of the OS systems. The C drive on the OS system is used to buffer the data if the Process Historian is not available (store and forward principal).

1. Analyzing the existing database (chapter [2](#)).
2. Disable the “Database backup” function in the Process Historian Management Console.
3. Set all external segments offline.
4. Disconnect existing PH from the terminal bus.
5. Stop the PH services.
6. Create backup on the existing PH (chapter [3](#)).
7. Install new PH.

You can find a description of the workflow in the application example “Installing and Commissioning of Process Historian in the PCS 7 environment”

<https://support.industry.siemens.com/cs/ww/en/view/66579062>

NOTE The DatabaseInstallationWizard creates user settings for the SQL server. Therefore it is necessary to run the DatabaseInstallationWizard before restoring the existing HistorianStorage database.

8. Stop the services “SIMATIC Process Historian” and “Process Historian Maintenance Service” on the new PH, in order to avoid that new database segments are created, before the database locations are changed.
9. Delete the new created (empty) HistorianStorage database.
10. Restore database on the new PH with new data distribution (chapter [4](#)).
11. Restart the Process Historian
12. Connect the new PH to the terminal bus.
13. Restart the Process Historian.

NOTICE Gaps in data recording on the PH are possible during the replacement of the Process Historian, due to store and forward buffer restrictions.

Result

The OS systems are connecting to the new Process Historian. After a waiting time, the OS systems are sending tag and alarm data to the Process Historian.

If the OS systems aren't able to connect to the new PH machine, the OS systems must be restarted.

2 Analyzing existing database

The disk location where the database files are located is stored in the following tables of the HistorianStorage database:

- dbo.DBConfiguration
- CONFIGURATION.TargetPath
- CONFIGURATION.Partition

Behaviour of Process Historian 2014 SP2 Update 1 or lower: If you restore a database on another disk location, the storage path information must be changed manually in this database tables. Therefore it is recommended to use PH 2014 SP2 Update2 or higher. Behaviour of Process Historian 2014 SP2 Update2 or higher

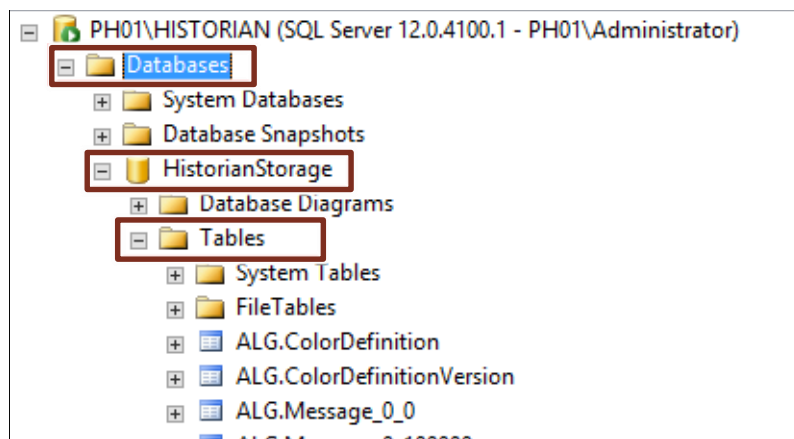
Since Process Historian 2014 SP2 Update2 the database tables dbo.DBConfiguration, CONFIGURATION.TargetPath and CONFIGURATION.Partition will be updated automatically.

NOTE

Therefore we recommend to upgrade the Process Historian to version 2014 SP2 Update2 or higher, before moving the database to the new Process Historian hardware.

2.1 Check the storage paths in the existing database

1. Start the SQL Server Management Studio.
2. Open the folder "Database > HistorianStorage > Tables".



2 Analyzing existing database

3. Perform a "Select Top 1000 Rows" statement on the table dbo.DBConfiguration.

The screenshot shows the SQL Server Enterprise Manager interface. In the top pane, the table **dbo.DBConfiguration** is selected, and the context menu is open, with **Select Top 1000 Rows** highlighted. The bottom pane shows the SQL query window with the following script:

```
/****** Script for SelectTopNRows command from SSMS *****/  
SELECT [Name]  
      ,[DataGroup]  
      ,[Size]  
      ,[MaxSize]  
      ,[FileGrowth]  
      ,[Path]  
      ,[Value]  
FROM [HistorianStorage].[dbo].[DBConfiguration]
```

Below the script, the 'Results' tab displays the top 1000 rows of the table. The table has 7 columns: Name, DataGroup, Size, MaxSize, FileGrowth, Path, and Value. The first 28 rows are shown in the screenshot.

	Name	DataGroup	Size	MaxSize	FileGrowth	Path	Value
1	Default	NULL	5MB	UNLIMITED	100MB	D:\Historian1\1\DB	NULL
2	Indexes	NULL	NULL	NULL	NULL	D:\Historian1\1\DB	NULL
3	PH_Log	NULL	4096MB	UNLIMITED	2048MB	D:\Historian1\1\TA	NULL
4	FG_PH_Primary	NULL	32MB	UNLIMITED	32MB	D:\Historian1\1\DB	NULL
5	FG_PH_TlgCSDData	NULL	100MB	UNLIMITED	100MB	D:\Historian1\1\DB	NULL
6	FG_PH_TlgRTData	0	3MB	UNLIMITED	128MB	D:\Historian1\1\DB	NULL
7	FG_PH_TlgRTData	0	3MB	UNLIMITED	128MB	D:\Historian1\1\DB	NULL
8	FG_PH_TlgCRTData	0	3MB	UNLIMITED	128MB	D:\Historian1\1\DB	NULL
9	FG_PH_AlgCSDData	NULL	100MB	UNLIMITED	100MB	D:\Historian1\1\DB	NULL
10	FG_PH_AlgRTData	0	3MB	UNLIMITED	128MB	D:\Historian1\1\DB	NULL
11	FG_PH_ConfigData	NULL	NULL	NULL	NULL	D:\Historian1\1\DB	NULL
12	FG_PH_GenericData	NULL	NULL	NULL	NULL	D:\Historian1\1\DB	NULL
13	FG_PH_CommonData	NULL	NULL	NULL	NULL	D:\Historian1\1\DB	NULL
14	FG_PH_DiagnosticsData	NULL	NULL	NULL	NULL	D:\Historian1\1\DB	NULL
15	FG_PH_MediaData	NULL	NULL	NULL	NULL	D:\Historian1\1\DB	NULL
16	FG_PH_Migration	NULL	NULL	NULL	NULL	D:\Historian1\1\DB	NULL
17	FG_PH_BatchCSDData	NULL	NULL	NULL	NULL	NULL	NULL
18	FG_PH_SimaticBatch_1	NULL	NULL	NULL	NULL	NULL	NULL
19	FG_PH_SimaticBatch_2	NULL	NULL	NULL	NULL	NULL	NULL
20	FG_PH_SimaticBatch_3	NULL	NULL	NULL	NULL	NULL	NULL
21	FG_PH_SimaticBatch_4	NULL	NULL	NULL	NULL	NULL	NULL
22	FG_PH_SimaticBatch_5	NULL	NULL	NULL	NULL	NULL	NULL
23	SegmentsToCreateInAdvance	NULL	NULL	NULL	NULL	NULL	1
24	AnchorPoint	NULL	NULL	NULL	NULL	NULL	2016-03-20 23:00:00.0000000 +00:00
25	TotalRuntimeSegments	NULL	NULL	NULL	NULL	NULL	5
26	SegmentUnitId	NULL	NULL	NULL	NULL	NULL	1
27	SegmentMultiplier	NULL	NULL	NULL	NULL	NULL	1
28	DatabaseName	NULL	NULL	NULL	NULL	NULL	HistorianStorage

2 Analyzing existing database

4. Perform a “Select Top 1000 Rows” statement on the table CONFIGURATION.Partition.

SQLQuery3.sql - PH80 Administrator (119) SQLQuery4.sql - PH80 Administrator (120) SQLQuery3.sql - PH80 Administrator (109) SQLQuery2.sql - PH80 Administrator (109) SQLQuery1.sql - PH80 Administrator (109)

***** Script for SelectTopRows command from SSMS *****
SELECT TOP 1000 [PartitionId]
 , [SegmentId]
 , [DataGroupId]
 , [DataCategoryID]
 , [LogicalFileGroupName]
 , [LogicalFileName]
 , [PhysicalFilePath]
 , [PartitionState]
 , [PartitionType]
 , [Flag1]
 , [Flag2]
 , [Flag3]
 , [Flag4]
 , [Flag5]
 , [Flag6]
 , [Flag7]
 , [Flag8]
FROM [HistorianStorage].[CONFIGURATION].[Partition]

100 %

Results Messages

PartitionId	SegmentId	DataGroupId	DataCategoryID	LogicalFileGroupName	LogicalFileName	PhysicalFilePath	PartitionState	
26	27	100005	0	2	FG_PH_TlgCRTData_0_27	PH_TlgCRTData_0_27	D:\Historian1\LOB\HistorianStorage_20160411_0_27.ndf	1
27	28	100005	0	3	FG_PH_AlgRTData_0_28	PH_AlgRTData_0_28	D:\Historian1\LOB\HistorianStorage_20160411_0_28.ndf	1
28	29	100005	0	6	FG_PH_TlgRTData_0_29	PH_TlgRTData_0_29	D:\Historian1\LOB\HistorianStorage_20160411_0_29.ndf	1
29	30	100006	0	1	FG_PH_TlgRTData_0_30	PH_TlgRTData_0_30	D:\Historian1\LOB\HistorianStorage_20160411_0_30.ndf	1
30	31	100006	0	2	FG_PH_TlgCRTData_0_31	PH_TlgCRTData_0_31	D:\Historian1\LOB\HistorianStorage_20160411_0_31.ndf	1
31	32	100006	0	3	FG_PH_AlgRTData_0_32	PH_AlgRTData_0_32	D:\Historian1\LOB\HistorianStorage_20160411_0_32.ndf	1
32	33	100006	0	6	FG_PH_TlgRTData_0_33	PH_TlgRTData_0_33	D:\Historian1\LOB\HistorianStorage_20160411_0_33.ndf	1
33	34	100007	0	1	FG_PH_TlgRTData_0_34	PH_TlgRTData_0_34	D:\Historian1\LOB\HistorianStorage_20160427_0_34.ndf	1
34	35	100007	0	2	FG_PH_TlgCRTData_0_35	PH_TlgCRTData_0_35	D:\Historian1\LOB\HistorianStorage_20160427_0_35.ndf	1
35	36	100007	0	3	FG_PH_AlgRTData_0_36	PH_AlgRTData_0_36	D:\Historian1\LOB\HistorianStorage_20160427_0_36.ndf	1
36	37	100007	0	6	FG_PH_TlgRTData_0_37	PH_TlgRTData_0_37	D:\Historian1\LOB\HistorianStorage_20160427_0_37.ndf	1
37	38	100008	0	1	FG_PH_TlgRTData_0_38	PH_TlgRTData_0_38	D:\Historian1\LOB\HistorianStorage_20160427_0_38.ndf	1
38	39	100008	0	2	FG_PH_TlgRTData_0_39	PH_TlgRTData_0_39	D:\Historian1\LOB\HistorianStorage_20160427_0_39.ndf	1
39	40	100008	0	3	FG_PH_AlgRTData_0_40	PH_AlgRTData_0_40	D:\Historian1\LOB\HistorianStorage_20160427_0_40.ndf	1
40	41	100008	0	6	FG_PH_TlgRTData_0_41	PH_TlgRTData_0_41	D:\Historian1\LOB\HistorianStorage_20160427_0_41.ndf	1
41	42	100009	0	1	FG_PH_TlgRTData_0_42	PH_TlgRTData_0_42	D:\Historian1\LOB\HistorianStorage_20160509_0_42.ndf	1
42	43	100009	0	2	FG_PH_TlgCRTData_0_43	PH_TlgCRTData_0_43	D:\Historian1\LOB\HistorianStorage_20160509_0_43.ndf	1

5. Perform a "Select Top 1000 Rows" statement on the table CONFIGURATION.TargetPath.

The screenshot shows a SQL query script in the 'Script' tab of SQL Server Enterprise Manager. The script is as follows:

```

/***** Script for SelectTopNRows command from SSMS *****/
SELECT TOP 1000 [TargetPathUID]
, [DataGroupId]
, [TargetPath]
, [DataCategoryID]
FROM [HistorianStorage].[CONFIGURATION].[TargetPath]
    
```

The 'Results' tab shows the following data:

	TargetPathUID	DataGroupId	TargetPath	DataCategoryID
1	9416FCC7-ABD4-4D74-9560-293EDAECBE19	0	D:\Historian1\DB	1
2	0C4EC8CF-BFD5-4BFB-8F5F-A4EC8FA999E9	0	D:\Historian1\DB	2
3	537760CD-50F9-41F3-A437-BE09A8B69A40	0	D:\Historian1\DB	3
4	D74DB9CF-519E-4438-BDCC-D238250242CF	0	D:\Historian1\DB	6

Explanation:

DataCategoryID	DataCategoryName	
1	TlgRTData	Taglogging Runtime Data
2	TlgCRTData	Taglogging Runtime Data
3	AlgRTData	Alarmlogging Runtime Data
4	TlgCSDData	Taglogging Configuration System Data
5	AlgCSDData	Alarmlogging Configuration System Data
6	TlgARTData	Taglogging Runtime Data

Result

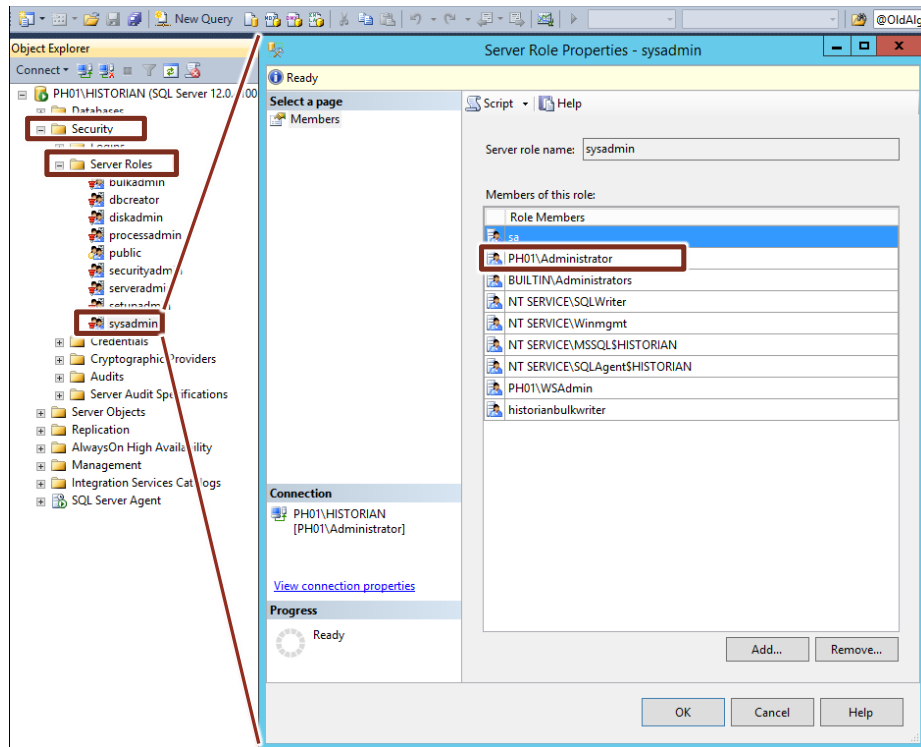
The existing database distribution is located on drive D:

- Tag Data = D:\Historian1\DB
- Alarm Data = D:\Historian1\DB
- Transaction Logfile = D:\Historian1\TA

2.2 Check the security settings in the existing database

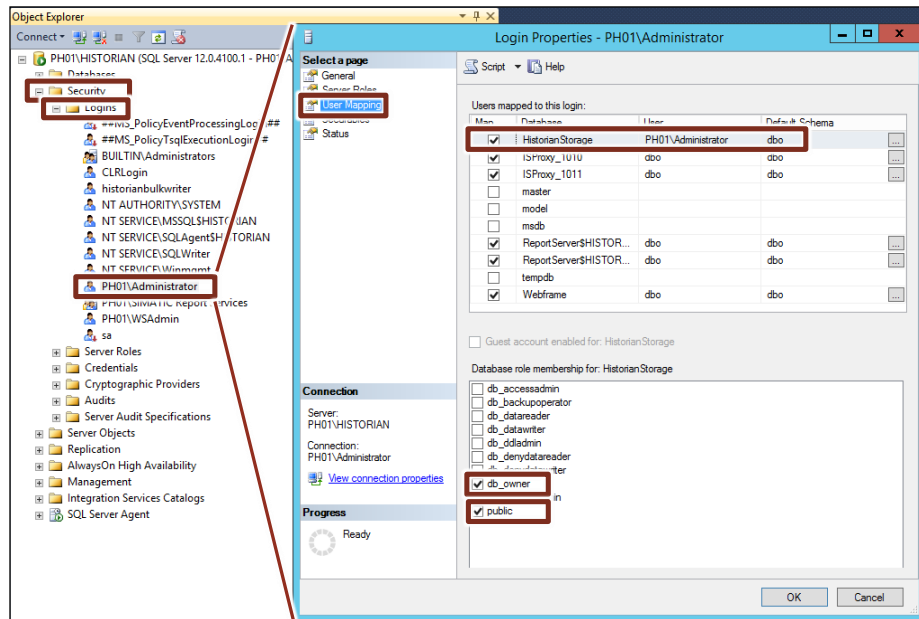
If we like to double check the security settings after the database restore, we need to check the settings in the existing DB first.

1. Open the SQL Server Management Studio
2. Browse to the folder “Server Roles” and find the current database administrator.



2 Analyzing existing database

3. Open the folder „Logins“ and check the “User Mapping” for the database administrator.



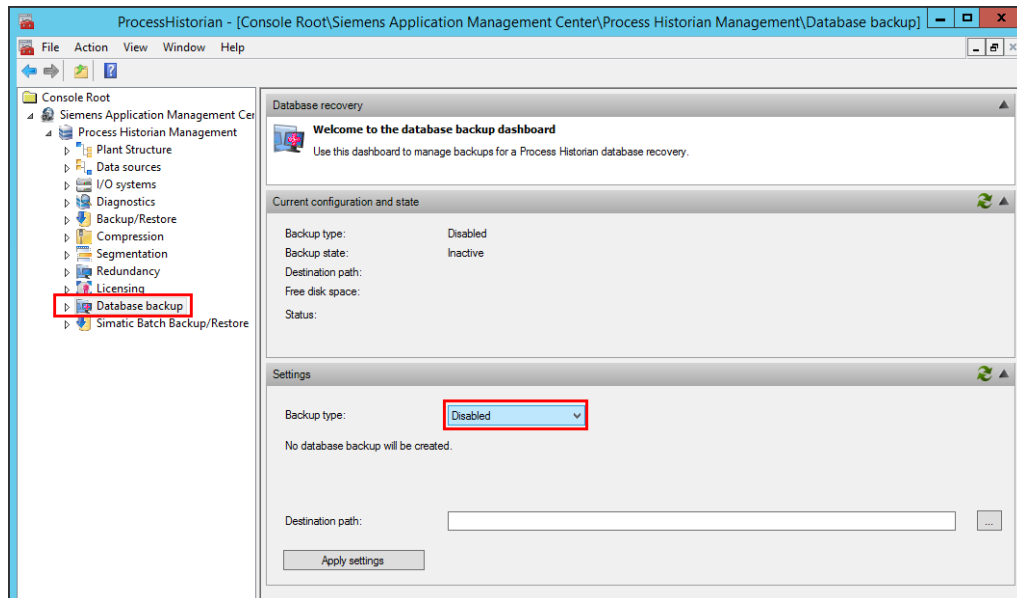
NOTE

If the current administrator machine login (administrator user credentials) on the existing PH machine and the target PH machine is different, it causes additional configuration changes in the HistorianStorage database.

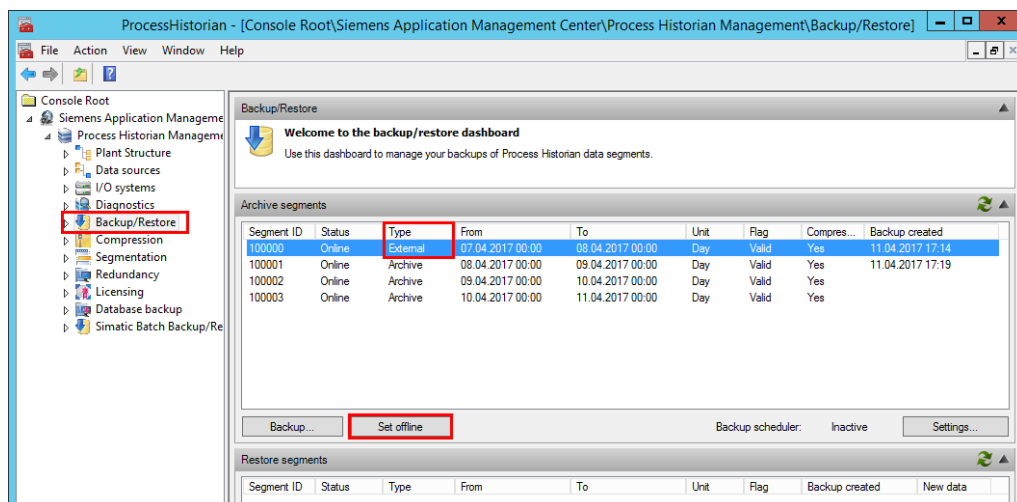
3 Creating database backup

3.1 Preparation

1. Open the Process Historian Management Console and disable the database backup



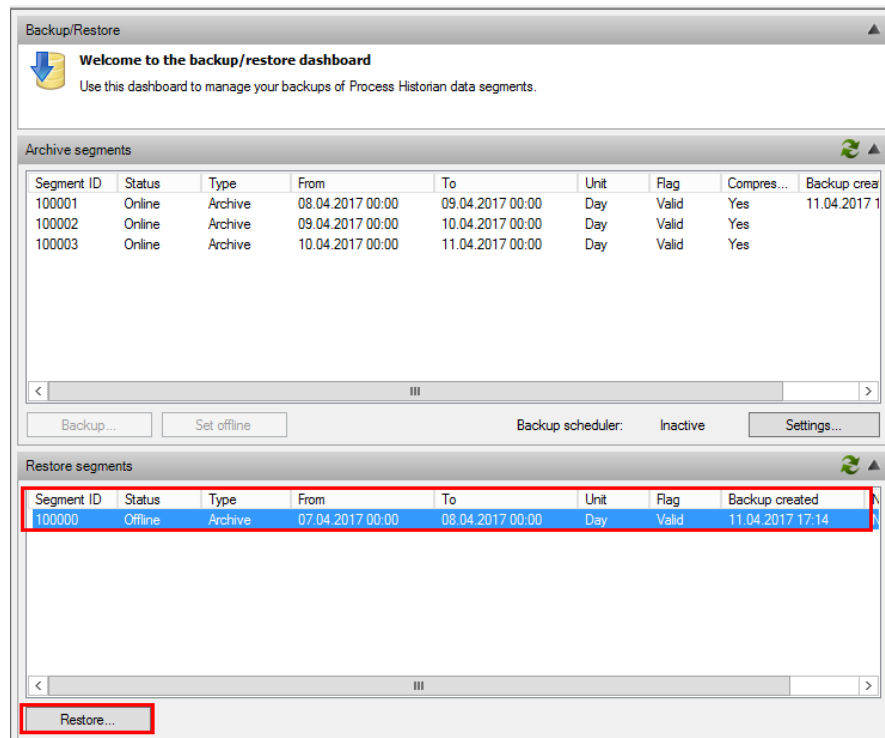
2. Open the Process Historian Management Console and set all external segments offline



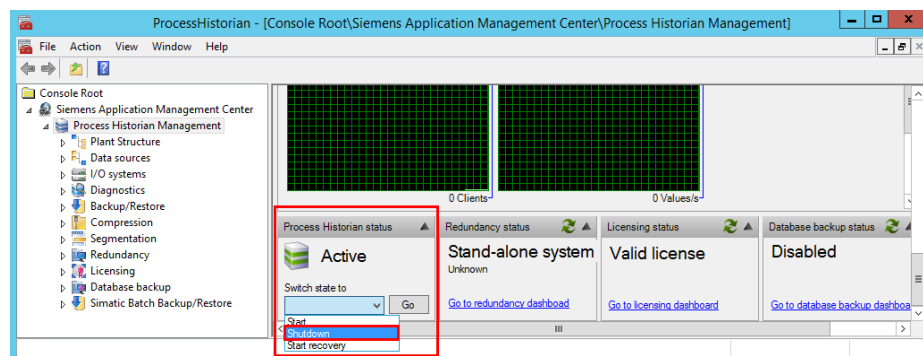
NOTE

Segment backup files must be copied to the new Process Historian Hardware. If necessary, it is possible to "Restore" segment backups on the target PH.

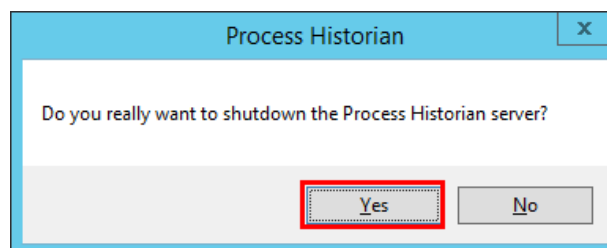
3 Creating database backup



3. Deactivate the PH with help of the PH Management Console. Use the drop down menu and choose "shutdown" and click on the "Go" button.

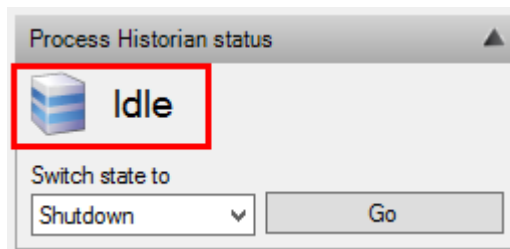


4. Click on the „Yes“ button.

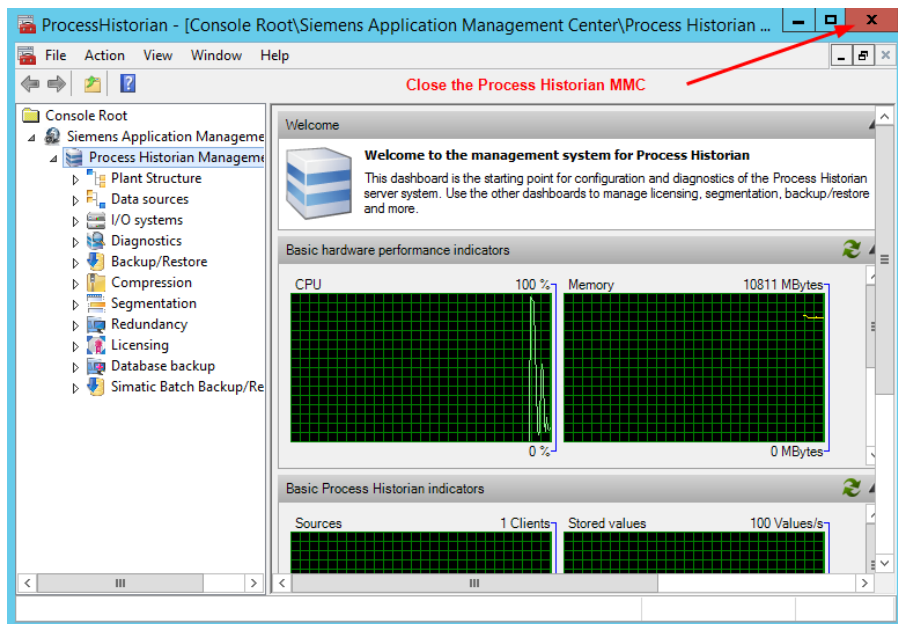


3 Creating database backup

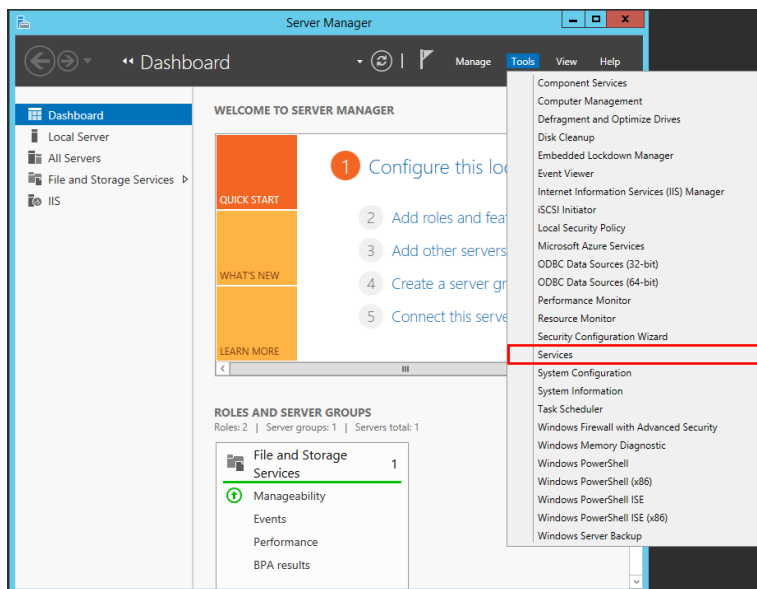
5. Wait until the PH is in state idle.



6. Close the Process Historian Management Console on the Process Historian.

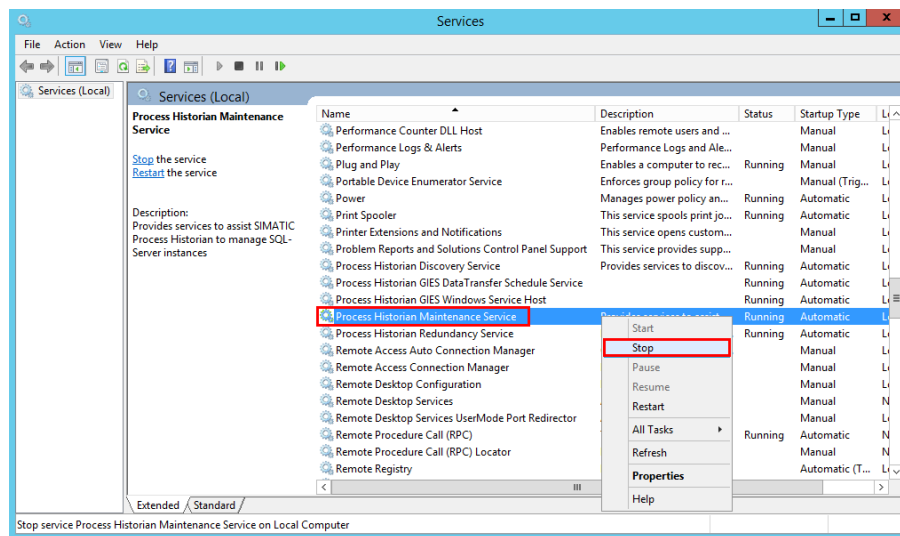


7. Open the tool "Services" on the "Microsoft Server Manager" on the PH.

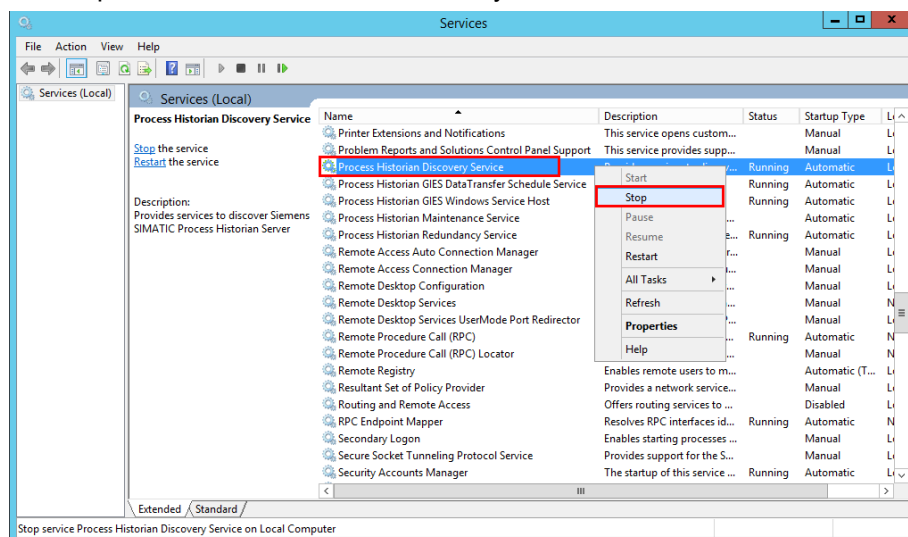


3 Creating database backup

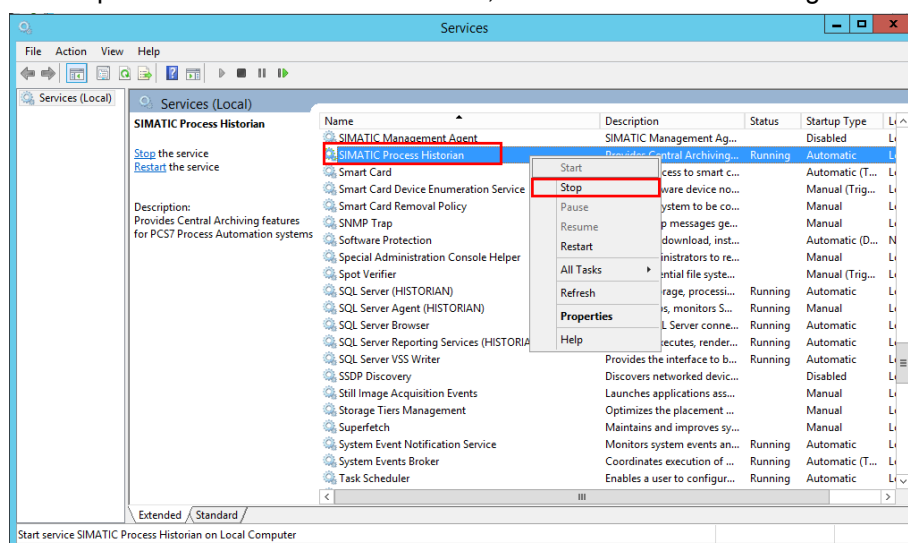
8. Stop the “Process Historian Maintenance Service”.



9. Stop the “Process Historian Discovery Service”, if the service is still running.



10. Stop the “Process Historian Service”, if the service is still running.

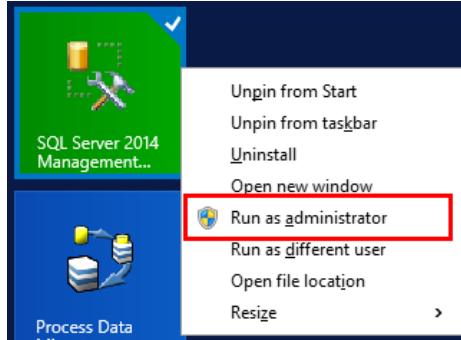


11. Close the “Service Menu” of the “Microsoft Server Manager”.

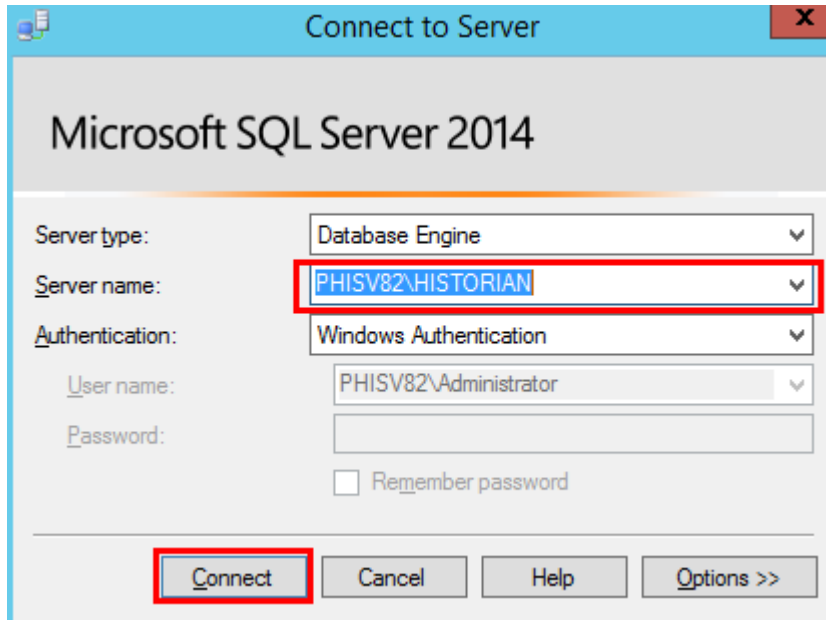
3.2 Procedure

The following table describes step by step how to create a full PH database backup.

1. Open the SQL Server Management Studio as administrator.

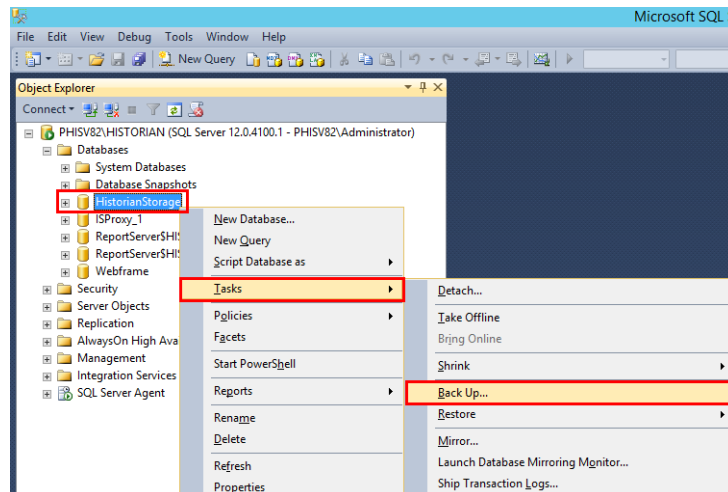


2. Connect to the Process Historian SQL Server. The server name is "<PH computer name>\HISTORIAN".

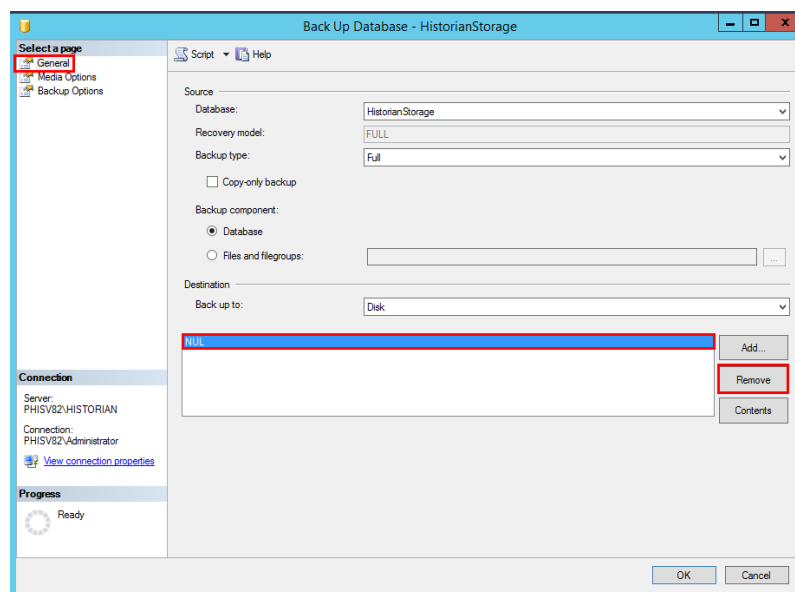


3. Create a full Database Backup. Expand the folder "Databases" > perform a right mouse click on the DB folder "Historian Storage" > click on the menu "Tasks" > click on the function "Back Up..."

3 Creating database backup

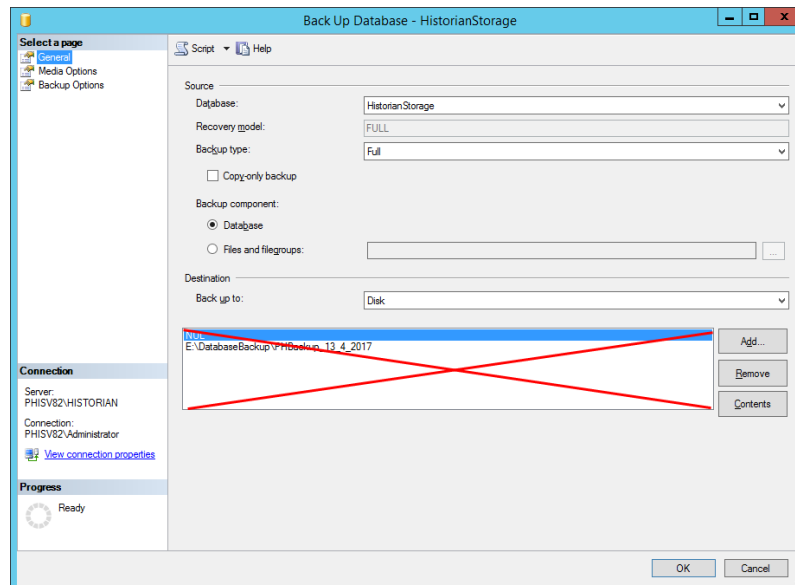


4. Remove the NUL destination, click on the "Remove" button.



CAUTION It is essential to remove the NUL destination and define a proper backup destination; otherwise no backup or a corrupt backup will be created.
The destination configuration mustn't be configured like this:

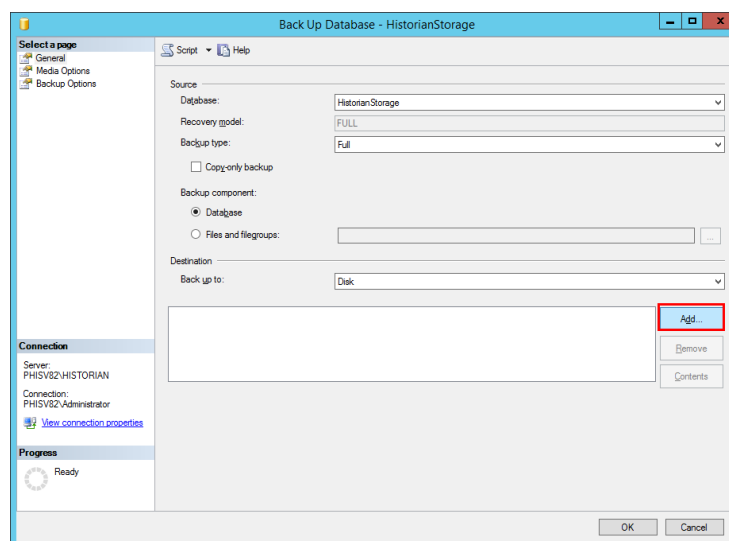
3 Creating database backup



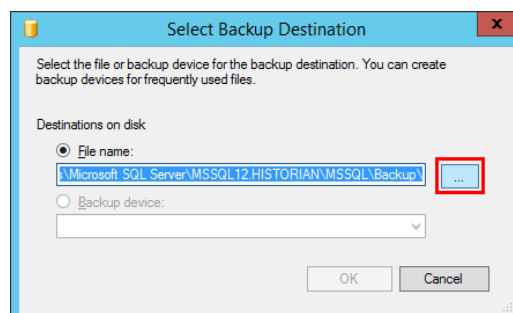
If you configure a destination path **and** NUL, the SQL Server creates a **corrupt backup file**.

If you create a corrupt backup file and delete the existing Process Historian Database, **you will lose all historical data**.

5. Click on the “Add” button

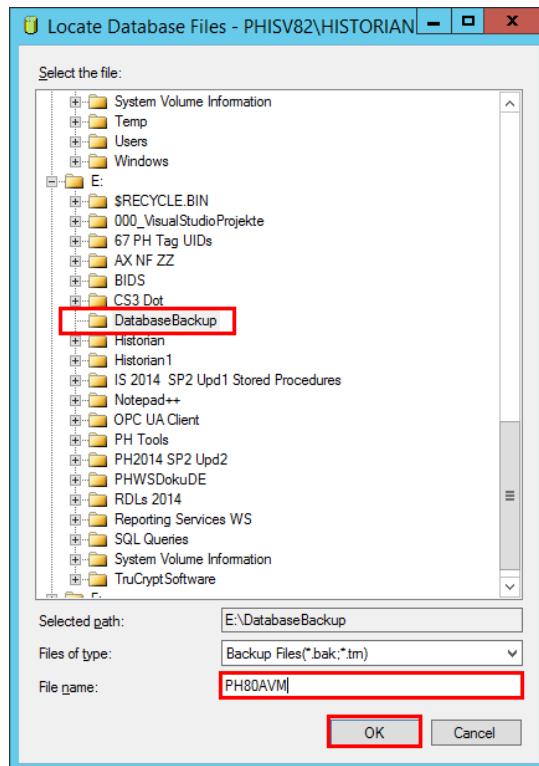


6. Click on the “...” button, to define a backup destination.

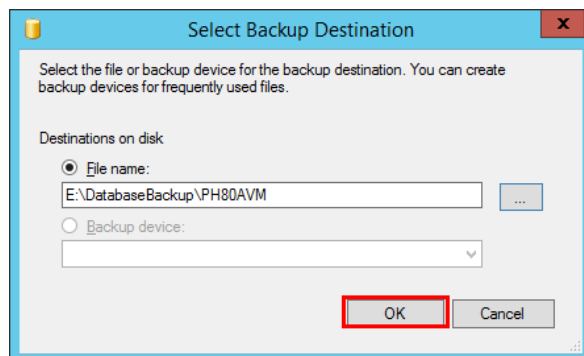


7. Define the backup destination and the backup file name and click on the “OK” button.

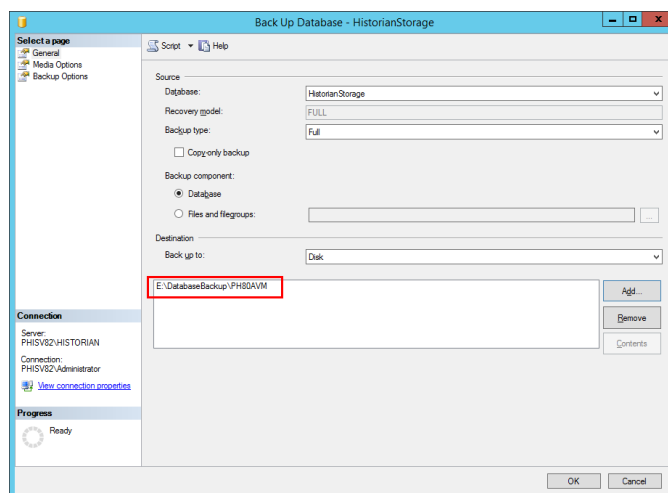
3 Creating database backup



8. Click on "OK" button



Result



3 Creating database backup

9. Choose the “Media Options” page and mark the radio button "Backup to new media set, and erase all existing backup sets". Choose the checkbox “Verify backup when finished”.

The screenshot shows the 'Back Up Database - HistorianStorage' dialog box with the 'Media Options' page selected. The 'Overwrite media' section has the radio button 'Back up to a new media set, and erase all existing backup sets' selected. The 'Reliability' section has the checkbox 'Verify backup when finished' checked. The 'Connection' section shows 'Server: PHISV82-HISTORIAN' and 'Connection: PHISV82-Administrator'. The 'Progress' section shows a 'Ready' status.

10. Choose the “Media Options” page, choose the option “Compress backup”. Click on the “OK” button to start the backup execution.

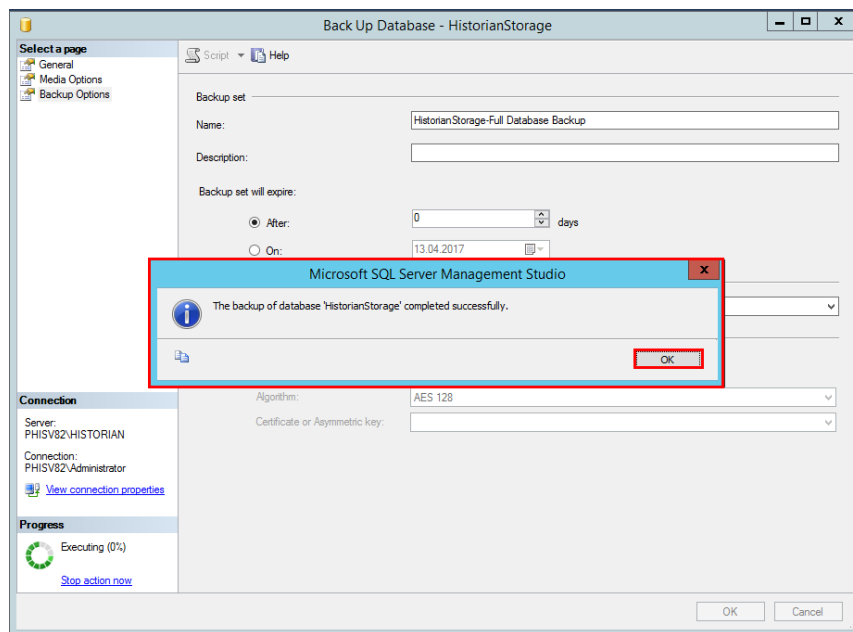
The screenshot shows the 'Back Up Database - HistorianStorage' dialog box with the 'Media Options' page selected. The 'Backup set' section shows 'Name: HistorianStorage-Full Database Backup'. The 'Compression' section has the dropdown 'Set backup compression:' set to 'Compress backup'. The 'Encryption' section has the checkbox 'Encrypt backup' unchecked. The 'Connection' section shows 'Server: PHISV82-HISTORIAN' and 'Connection: PHISV82-Administrator'. The 'Progress' section shows a 'Ready' status. The 'OK' button is highlighted.

NOTE

We recommend verifying the backup with help of the radio button “Verify backup when finished”. The backup creation takes more time if you verify the backup, especially for huge databases.

3 Creating database backup

11. Click on the “OK” button.



NOTE

A file of a full database backup could be huge, if the database is huge! Creating a huge backup file is also time consuming.

4 Restore database with new data distribution

4.1 New database distribution

The new database distribution shall be located on following spaces:

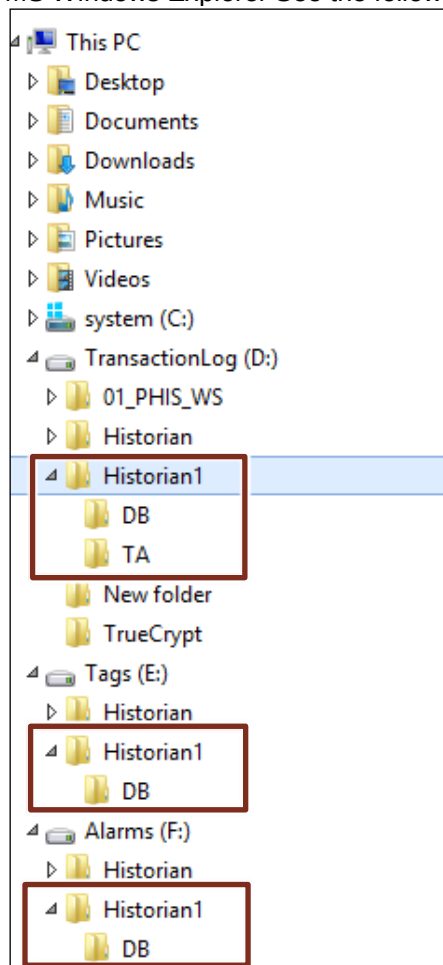
- Transaction Logfile = D:\Historian1\TA
- Tag Data + Common Data + Configuration Data = E:\Historian1\DB
- Alarm Data = F:\Historian1\DB

NOTE

Adapting the restore SQL query must be done with care! If the database restore has been done with failures, the database will fail. In this case data loss can be the result.

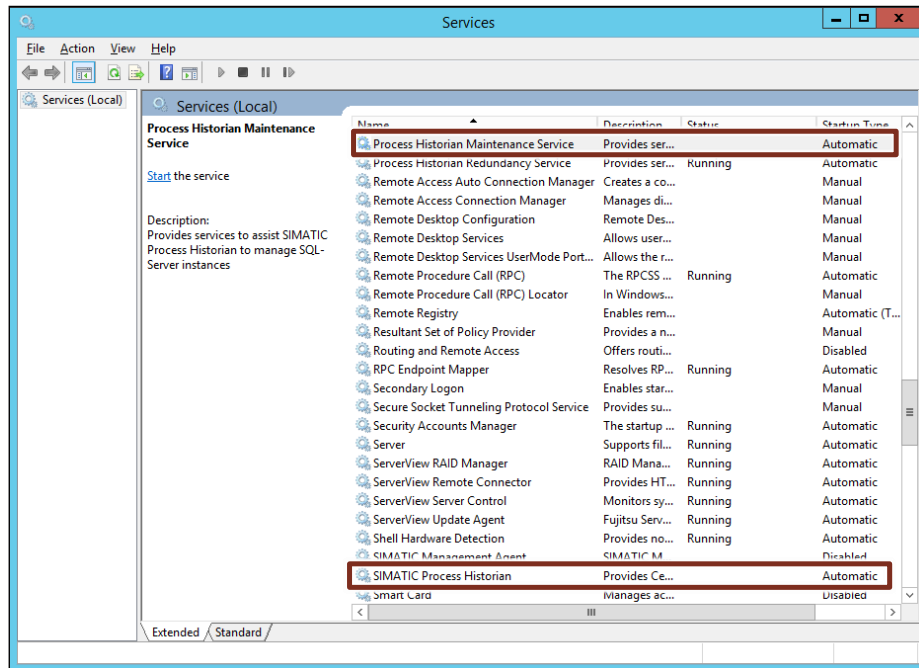
4.2 Procedure

Create the folder for database distribution on drive D, E and F, with help of the MS Windows Explorer See the following screenshot:



4 Restore database with new data distribution

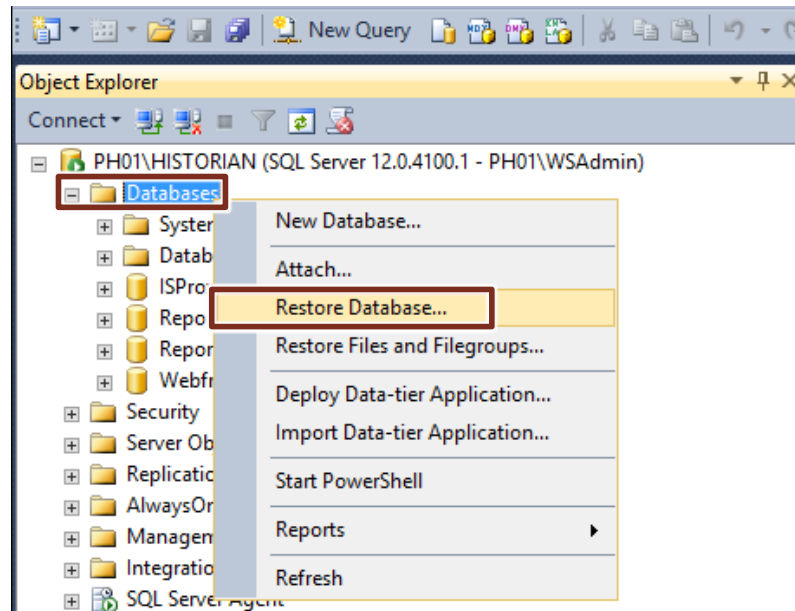
4. Stop the services “SIMATIC Process Historian” and “Process Historian Maintenance Service”.



5. Open the SQL Server Management Studio.

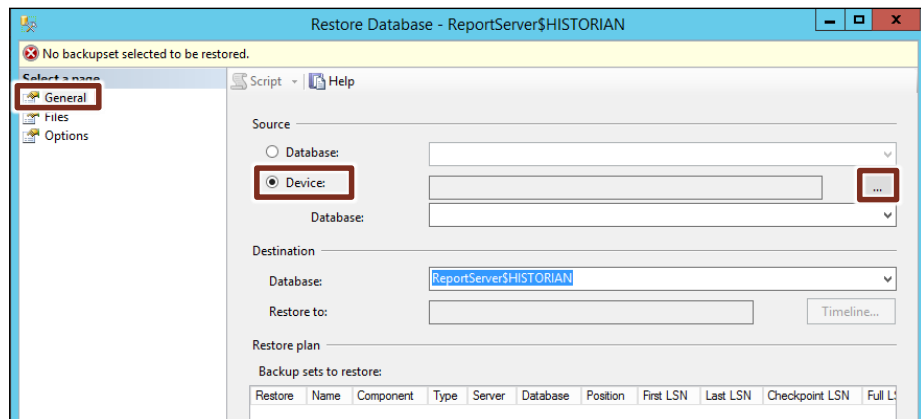


6. Perform a right mouse click on the object “Databases”.
7. Click on the menu “Restore Database...” menu.

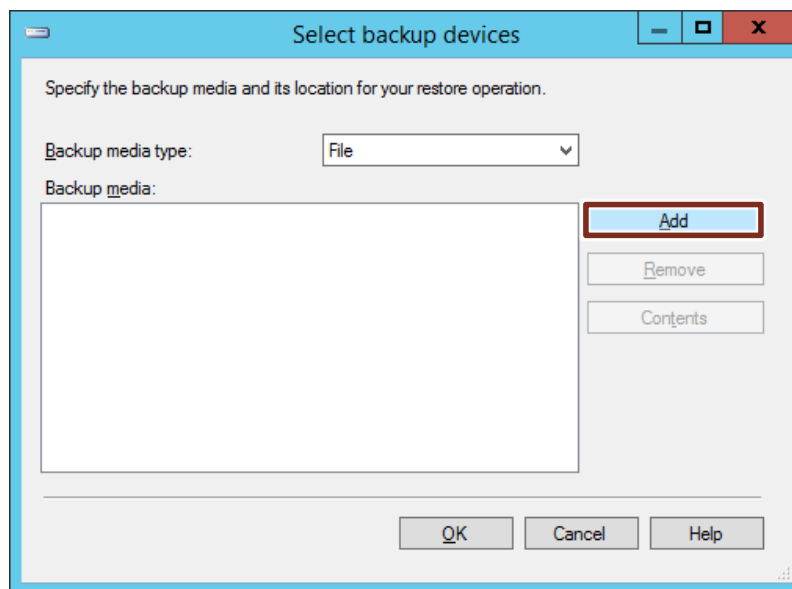


4 Restore database with new data distribution

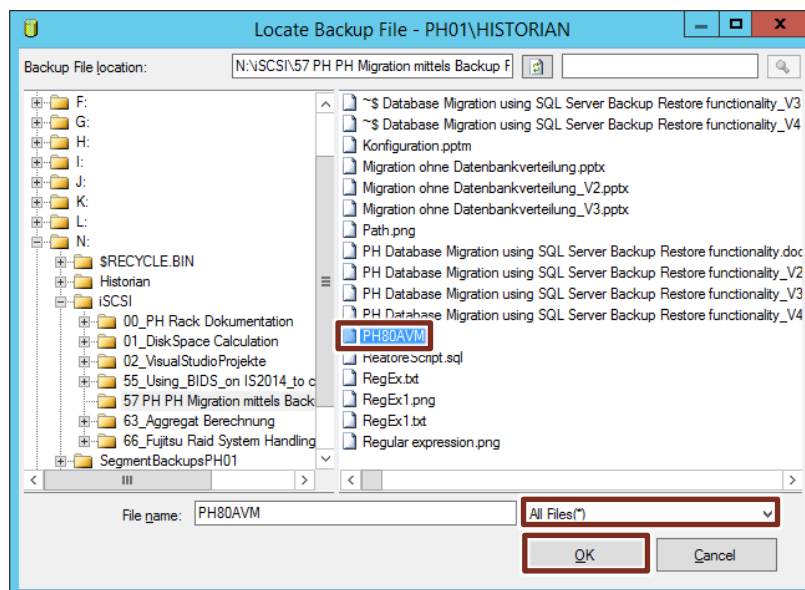
8. Use the “General” tab. Click on the radio button “Device”. Click on the “...” Button to define the backup file.



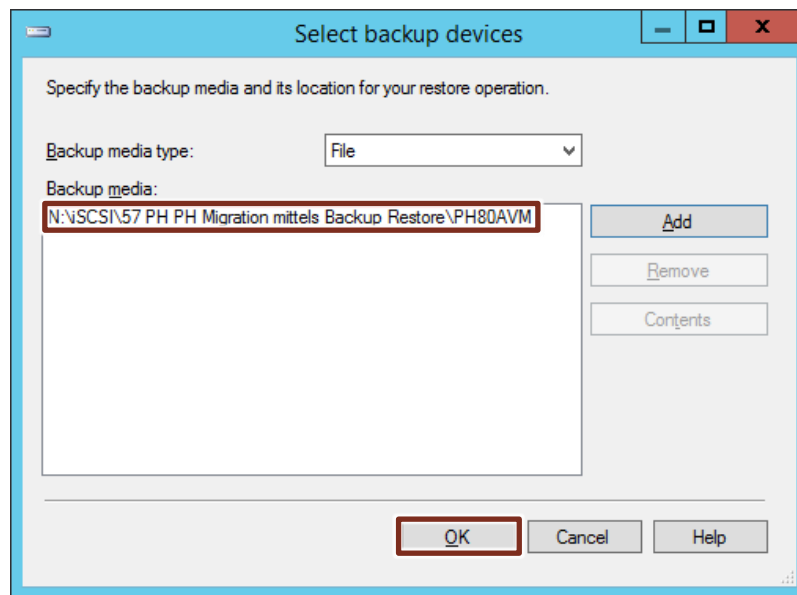
9. Click on the “Add” button.



10. Define “All files”, browse to your backup file and click on the “OK” button.

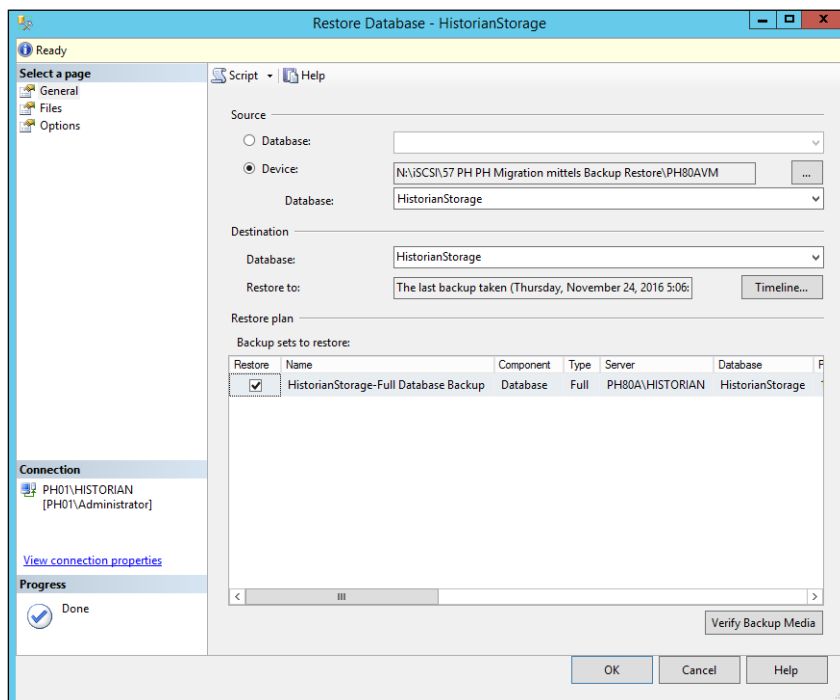


11. Click on the “OK” button.



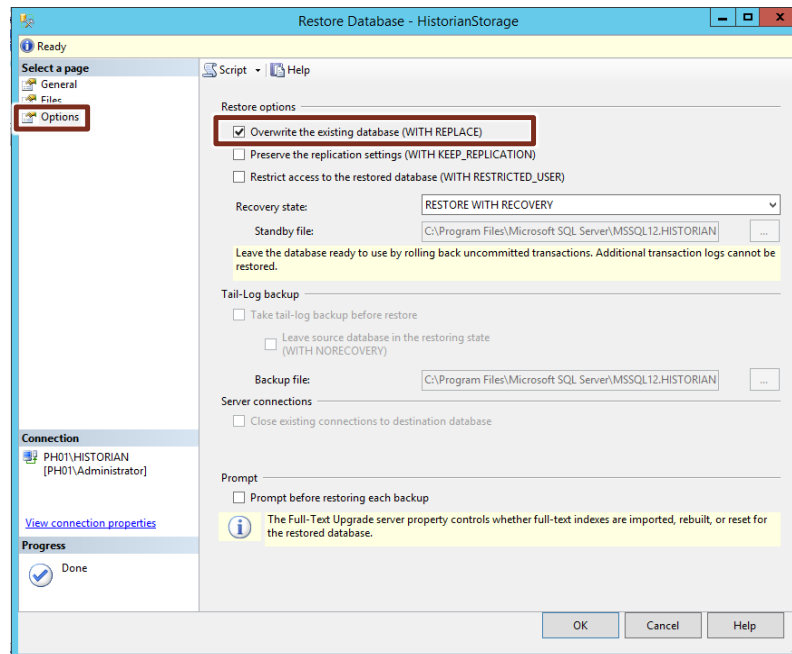
Result:

The backup file is defined.

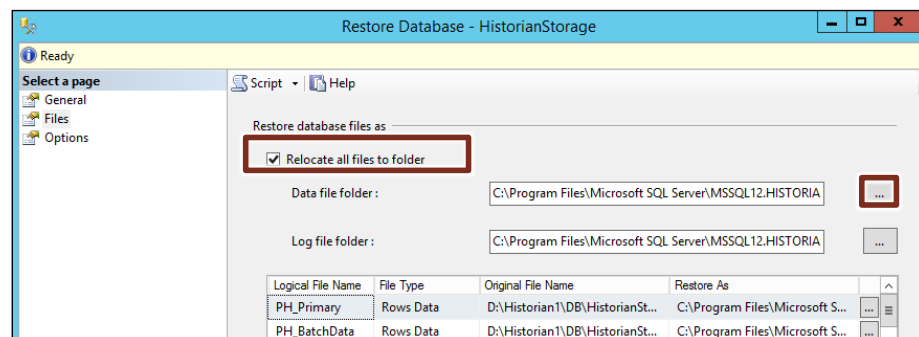


Set the new database

1. Change to the “Option” tab and set the checkbox “Overwrite the existing database (with replace)”.

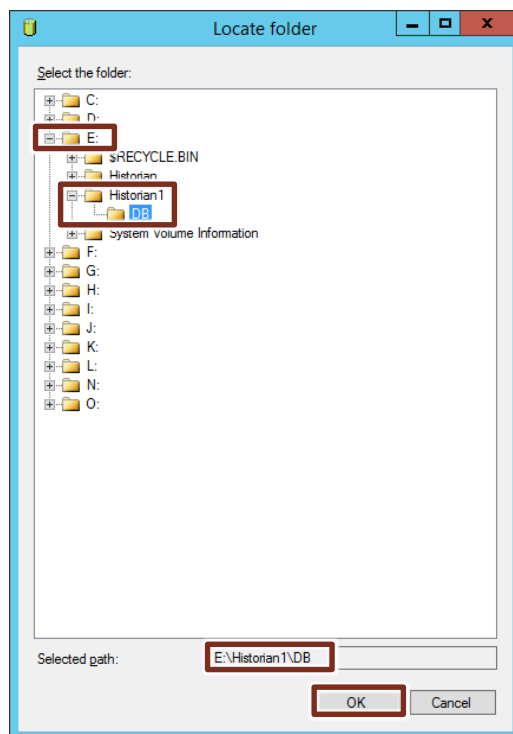


2. Change to the “Files” menu. Set the Checkbox “Relocate all files to folder” and click on the “...” button for “Data file folder”.

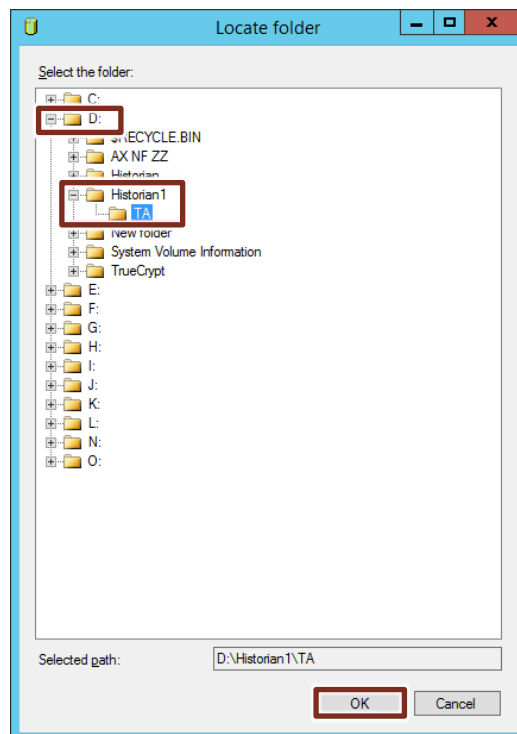


4 Restore database with new data distribution

3. Define the storage location for all database files and click on the OK button.



4. Define the storage location for the "Log file folder" in the same manner.

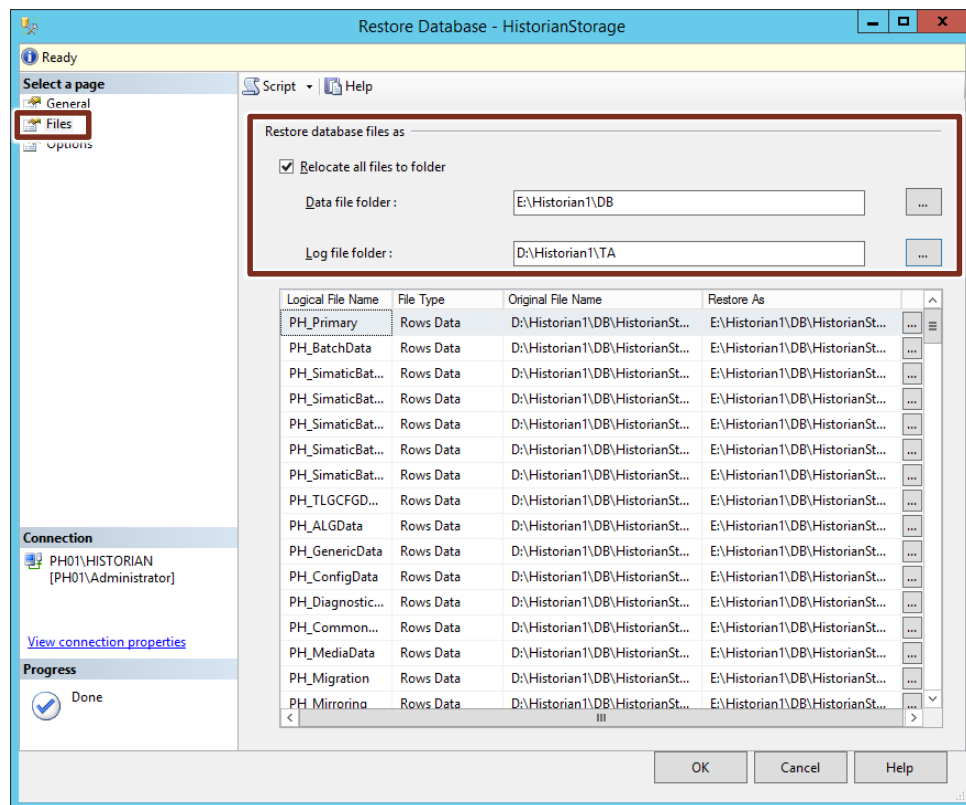


NOTE

It is only possible to reallocate the file folder location, if the defined folder location in the backup file is unknown.

Result

The new file locations for the transaction log file and **all** data files are defined.



Hint

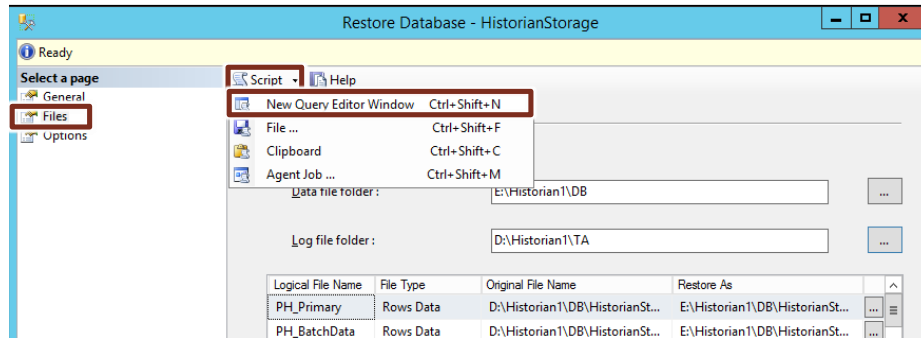
It is not possible to create every possible database distribution with help of this dialog. It is only possible to store all database files on the same disk drive and the transaction log file on a different disk drive.

New SQL query storage location

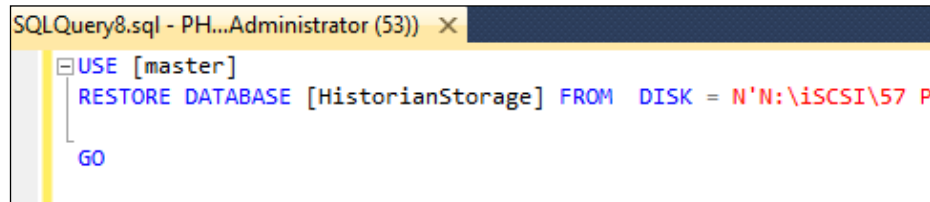
The system creates a SQL query to restore the PH database. But with help of the existing query all tags, alarms and common data will be stored in the file location “E:\Historian1\DB”.

The goal is, to store all alarm data in the location “F:\Historian1\DB”. Therefore we need to change the storage location for alarms in the SQL query.

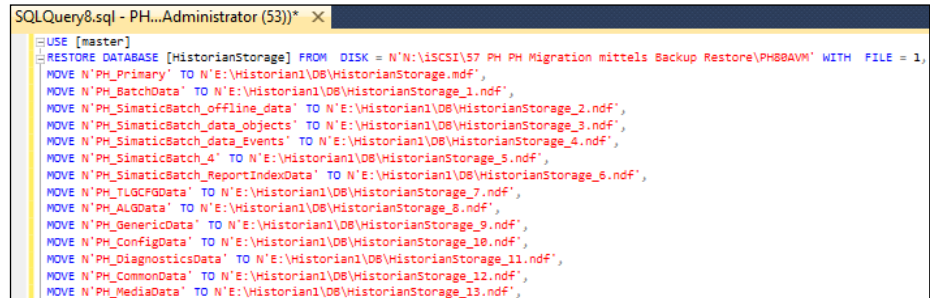
1. Click on the menu “Script” and choose the function “New Query Editor Window”.



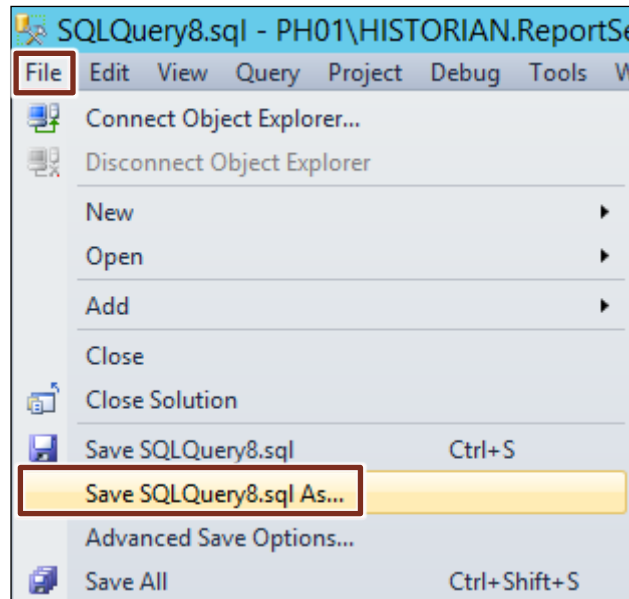
2. The created query is a long string inline.



3. Configure line breaks for a better overview.



4. Store the query on your local disk drive with help of the SQL Server Management Studio. Use the function “SaveSQLQuery.sql AS...” in the menue “File”.

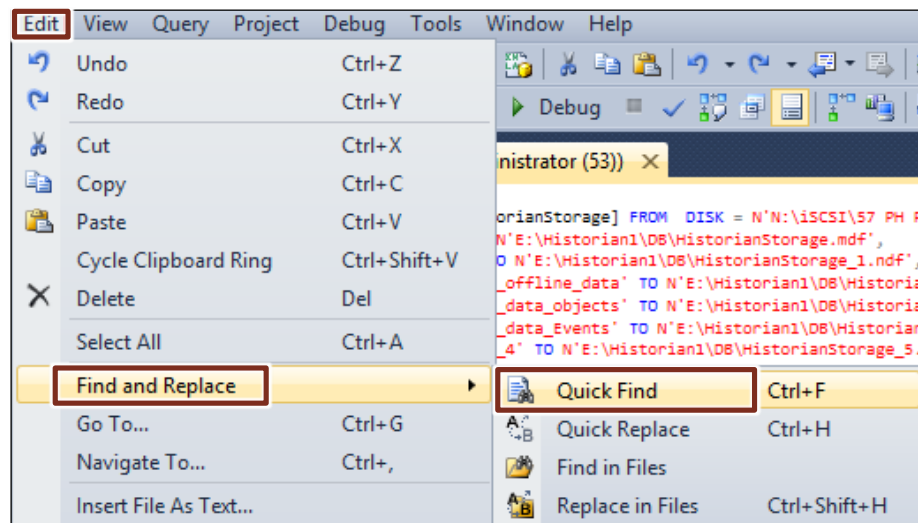


NOTE

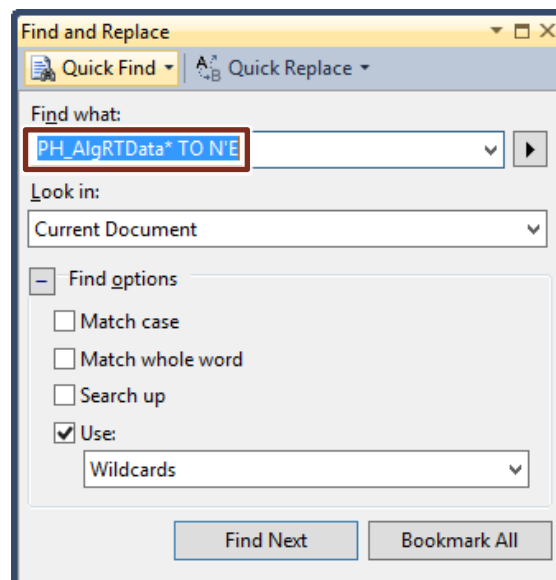
Change the storage path for all “AlgRTData” ndf-files to “F:\Historian1\DB”. Operate as described in the following steps.

```
MOVE N'PH_TlgARTData_0_8' TO N'E:\Historian1\DB\HistorianStorage_22.ndf',
MOVE N'PH_TlgARTData_0_69' TO N'E:\Historian1\DB\HistorianStorage_23.ndf',
MOVE N'PH_TlgRTData_0_70' TO N'E:\Historian1\DB\HistorianStorage_24.ndf',
MOVE N'PH_TlgCRTData_0_71' TO N'E:\Historian1\DB\HistorianStorage_25.ndf',
MOVE N'PH_AlgRTData_0_72' TO N'E:\Historian1\DB\HistorianStorage_26.ndf',
MOVE N'PH_TlgAKIDData_0_73' TO N'E:\Historian1\DB\HistorianStorage_27.ndf',
MOVE N'PH_TlgRTData_0_14' TO N'E:\Historian1\DB\HistorianStorage_28.ndf',
MOVE N'PH_TlgCRTData_0_15' TO N'E:\Historian1\DB\HistorianStorage_29.ndf',
MOVE N'PH_AlgRTData_0_16' TO N'E:\Historian1\DB\HistorianStorage_30.ndf',
MOVE N'PH_TlgARTData_0_17' TO N'E:\Historian1\DB\HistorianStorage_31.ndf',
MOVE N'PH_TlgRTData_0_18' TO N'E:\Historian1\DB\HistorianStorage_32.ndf',
MOVE N'PH_TlgCRTData_0_19' TO N'E:\Historian1\DB\HistorianStorage_33.ndf',
```

5. Click on the menu "Edit > Find and Replace > Quick Find".

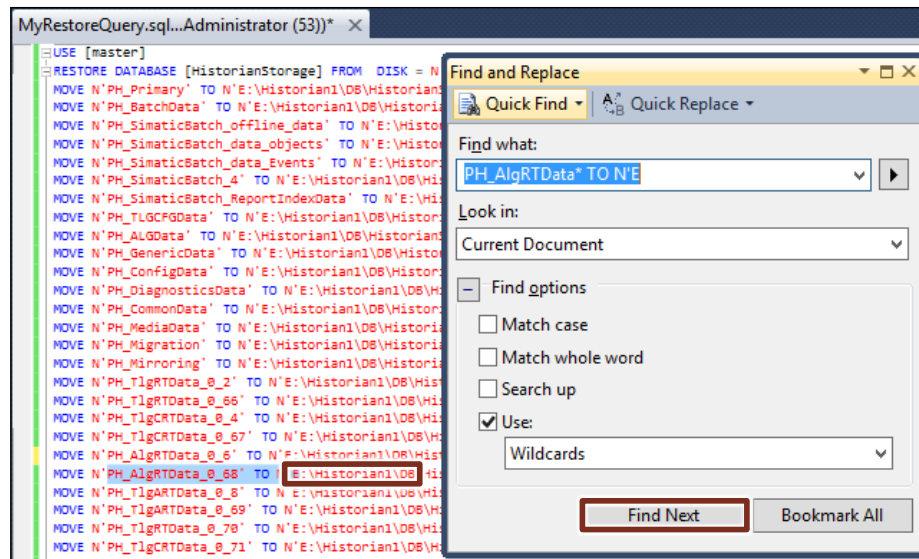


6. Define the search string "PH_AlgRTData* TO N'E" to find all storage paths which needs to be changed.

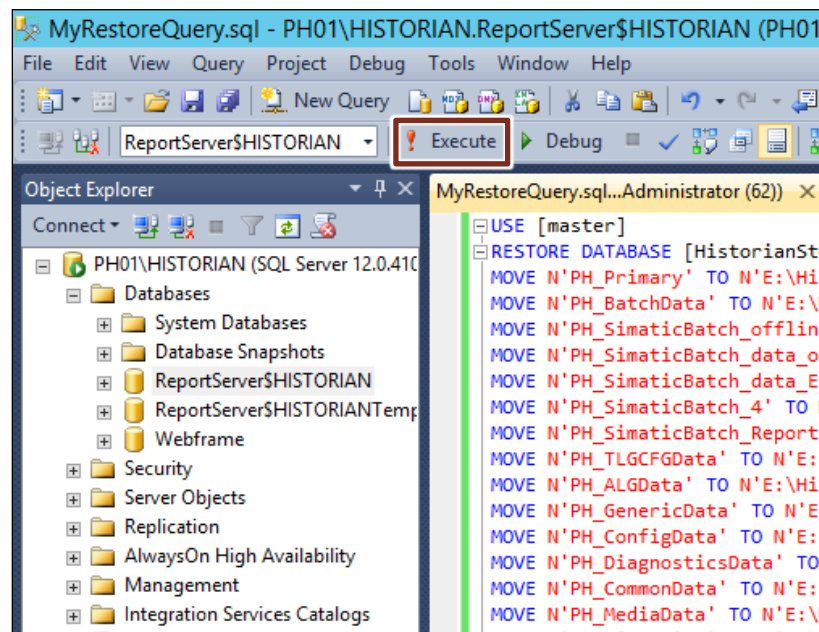


4 Restore database with new data distribution

- Click on the “Find Next” button and change the storage path. In this example you need to exchange “E:\Historian1\DB” against “F:\Historian1\DB”.

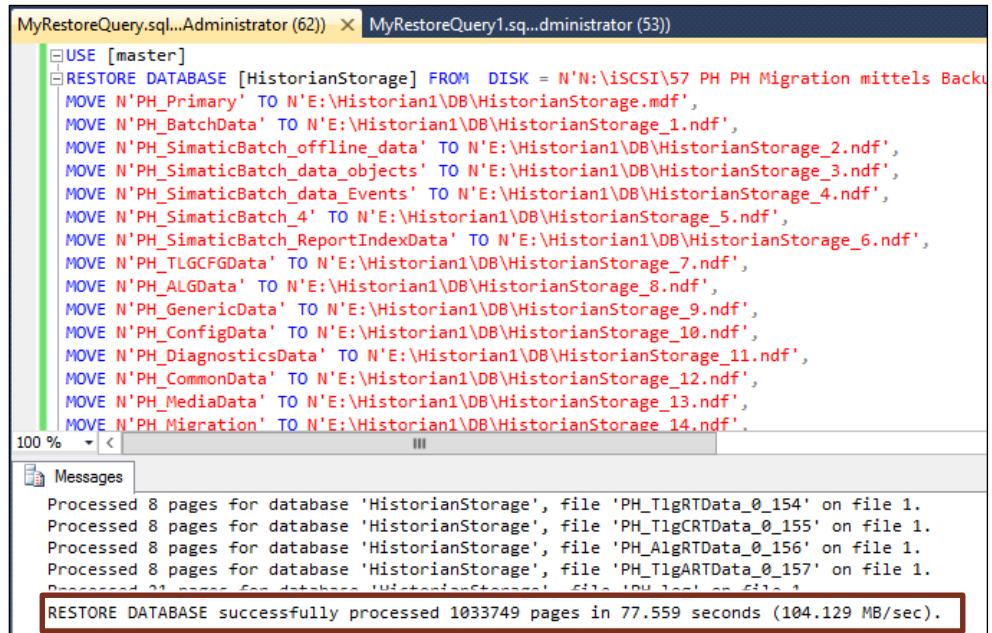


- Change all storage paths for Alarm Logging Runtime Data (PH_AlgrtData). Depending on the database size and the amount of data groups, it could be hundreds of changes.
- Execute the SQL query in order to restore the database.



Result

Database restore was successfully.



The screenshot shows a SQL Server Enterprise Manager window with two tabs: 'MyRestoreQuery.sql...Administrator (62))' and 'MyRestoreQuery1.sql...dministrator (53))'. The active tab displays a T-SQL script for restoring the 'HistorianStorage' database from disk. The script includes a 'USE [master];' statement followed by a 'RESTORE DATABASE [HistorianStorage] FROM DISK =' statement, which is followed by a list of 'MOVE' statements for various data files. Below the script, the 'Messages' pane shows the execution progress, including the final summary: 'RESTORE DATABASE successfully processed 1033749 pages in 77.559 seconds (104.129 MB/sec)'.

```
USE [master]
RESTORE DATABASE [HistorianStorage] FROM DISK = 'N:\iscsi\57 PH PH Migration mittels Backu
MOVE N'PH_Primary' TO N'E:\Historian1\DB\HistorianStorage.mdf',
MOVE N'PH_BatchData' TO N'E:\Historian1\DB\HistorianStorage_1.ndf',
MOVE N'PH_SimaticBatch_offline_data' TO N'E:\Historian1\DB\HistorianStorage_2.ndf',
MOVE N'PH_SimaticBatch_data_objects' TO N'E:\Historian1\DB\HistorianStorage_3.ndf',
MOVE N'PH_SimaticBatch_data_Events' TO N'E:\Historian1\DB\HistorianStorage_4.ndf',
MOVE N'PH_SimaticBatch_4' TO N'E:\Historian1\DB\HistorianStorage_5.ndf',
MOVE N'PH_SimaticBatch_ReportIndexData' TO N'E:\Historian1\DB\HistorianStorage_6.ndf',
MOVE N'PH_TLGCFGData' TO N'E:\Historian1\DB\HistorianStorage_7.ndf',
MOVE N'PH_ALGData' TO N'E:\Historian1\DB\HistorianStorage_8.ndf',
MOVE N'PH_GenericData' TO N'E:\Historian1\DB\HistorianStorage_9.ndf',
MOVE N'PH_ConfigData' TO N'E:\Historian1\DB\HistorianStorage_10.ndf',
MOVE N'PH_DiagnosticsData' TO N'E:\Historian1\DB\HistorianStorage_11.ndf',
MOVE N'PH_CommonData' TO N'E:\Historian1\DB\HistorianStorage_12.ndf',
MOVE N'PH_MediaData' TO N'E:\Historian1\DB\HistorianStorage_13.ndf',
MOVE N'PH_Migration' TO N'E:\Historian1\DB\HistorianStorage_14.ndf'.
```

Messages

Processed 8 pages for database 'HistorianStorage', file 'PH_TlgRTData_0_154' on file 1.
Processed 8 pages for database 'HistorianStorage', file 'PH_TlgCRTData_0_155' on file 1.
Processed 8 pages for database 'HistorianStorage', file 'PH_AlgRTData_0_156' on file 1.
Processed 8 pages for database 'HistorianStorage', file 'PH_TlgARTData_0_157' on file 1.
Processed 21 pages for database 'HistorianStorage', file 'PH_1st' on file 1.
RESTORE DATABASE successfully processed 1033749 pages in 77.559 seconds (104.129 MB/sec).

10. Restart the Process Historian

Result

For PH 2014 SP2 Update2 or higher, the database storage paths will be adapted automatically after the restart of the Process Historian.

11. Check the correctness of the database storage paths in the database tables `dbo.DBConfiguration`, `CONFIGURATION.TargetPath` and `CONFIGURATION.Partition`

NOTE

If the storage paths are not adapted, restart the Process Historian machine again.

5 Using Notepad++ for SQL string manipulation

There are text editors available on the market which can handle regular expressions. This is an example how to use the Notepad++ to manipulate the storage paths in the SQL string.

The Notepad++ is not part of the PH installation and must be downloaded from the internet, if this is possible for the customer.

In order to avoid making hundreds of changes in the SQL string manually, you can use for instance a regular expression to change all storage paths automated.

Regular expression for search

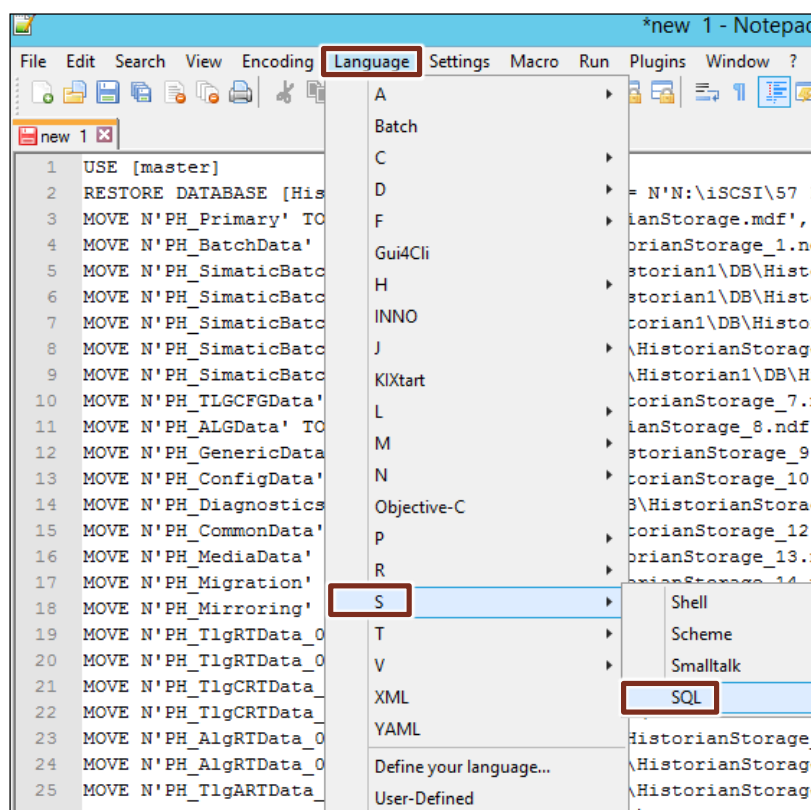
`(PH_AlgRTData.* TO N')E(:)`

Regular expression for exchange

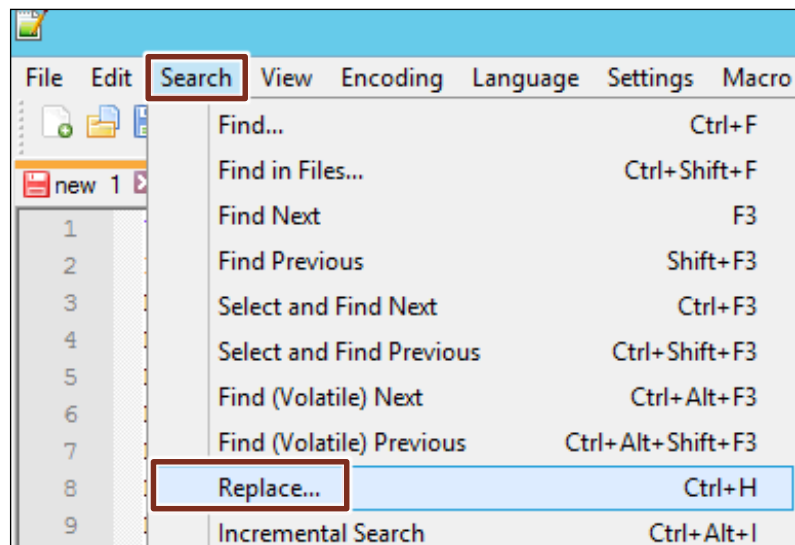
`$1F$2`

Using regular expression in Notepad++

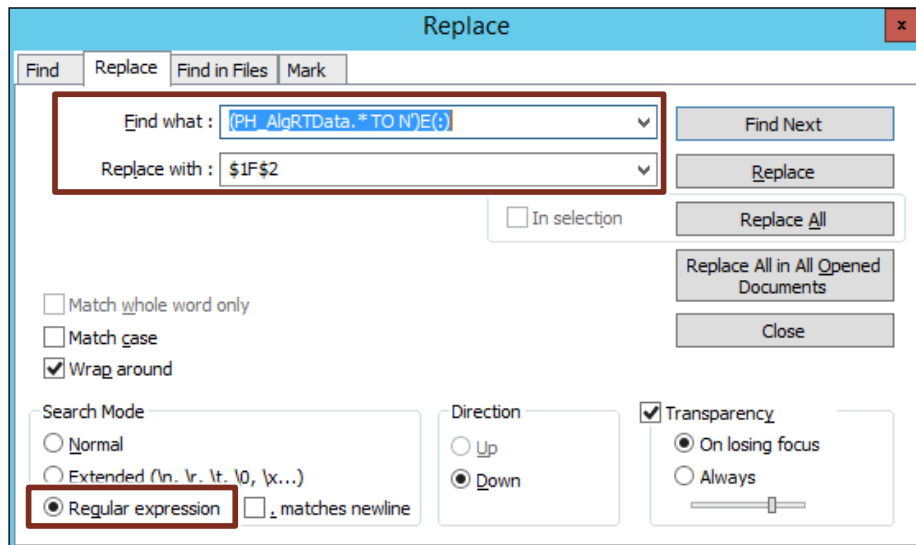
1. Copy the SQL String into Notepad++
2. Define the language as SQL



3. Open the Replace menu

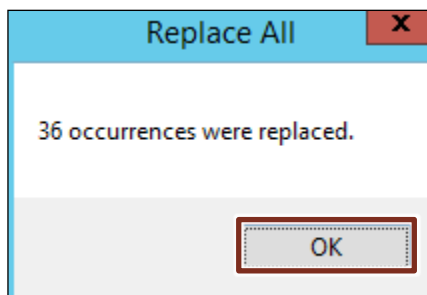


4. Define the regular expression for replacing.

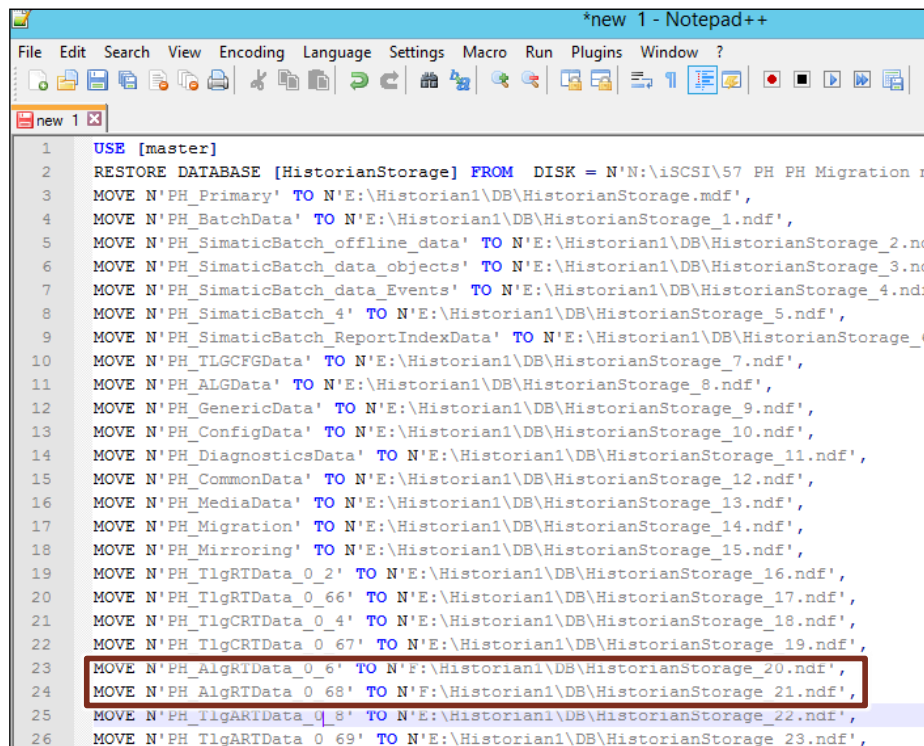


NOTE In order to use the replace functionality, line breaks must be configured manually.

5. Click on "Replace All".
6. Click on "OK".



7. Check the manipulated SQL string.



```
*new 1 - Notepad++
File Edit Search View Encoding Language Settings Macro Run Plugins Window ?
new 1
1 USE [master]
2 RESTORE DATABASE [HistorianStorage] FROM DISK = N'N:\iSCSI\57 PH PH Migration n
3 MOVE N'PH_Primary' TO N'E:\Historian1\DB\HistorianStorage.mdf',
4 MOVE N'PH_BatchData' TO N'E:\Historian1\DB\HistorianStorage_1.ndf',
5 MOVE N'PH_SimaticBatch_offline_data' TO N'E:\Historian1\DB\HistorianStorage_2.nd
6 MOVE N'PH_SimaticBatch_data_objects' TO N'E:\Historian1\DB\HistorianStorage_3.nd
7 MOVE N'PH_SimaticBatch_data_Events' TO N'E:\Historian1\DB\HistorianStorage_4.ndf
8 MOVE N'PH_SimaticBatch_4' TO N'E:\Historian1\DB\HistorianStorage_5.ndf',
9 MOVE N'PH_SimaticBatch_ReportIndexData' TO N'E:\Historian1\DB\HistorianStorage_6
10 MOVE N'PH_TLGCFGData' TO N'E:\Historian1\DB\HistorianStorage_7.ndf',
11 MOVE N'PH_ALGData' TO N'E:\Historian1\DB\HistorianStorage_8.ndf',
12 MOVE N'PH_GenericData' TO N'E:\Historian1\DB\HistorianStorage_9.ndf',
13 MOVE N'PH_ConfigData' TO N'E:\Historian1\DB\HistorianStorage_10.ndf',
14 MOVE N'PH_DiagnosticsData' TO N'E:\Historian1\DB\HistorianStorage_11.ndf',
15 MOVE N'PH_CommonData' TO N'E:\Historian1\DB\HistorianStorage_12.ndf',
16 MOVE N'PH_MediaData' TO N'E:\Historian1\DB\HistorianStorage_13.ndf',
17 MOVE N'PH_Migration' TO N'E:\Historian1\DB\HistorianStorage_14.ndf',
18 MOVE N'PH_Mirroring' TO N'E:\Historian1\DB\HistorianStorage_15.ndf',
19 MOVE N'PH_TlgRTData_0_2' TO N'E:\Historian1\DB\HistorianStorage_16.ndf',
20 MOVE N'PH_TlgRTData_0_66' TO N'E:\Historian1\DB\HistorianStorage_17.ndf',
21 MOVE N'PH_TlgCRTData_0_4' TO N'E:\Historian1\DB\HistorianStorage_18.ndf',
22 MOVE N'PH_TlgCRTData_0_67' TO N'E:\Historian1\DB\HistorianStorage_19.ndf',
23 MOVE N'PH_AlgRTData_0_6' TO N'F:\Historian1\DB\HistorianStorage_20.ndf',
24 MOVE N'PH_AlgRTData_0_68' TO N'F:\Historian1\DB\HistorianStorage_21.ndf',
25 MOVE N'PH_TlgAKIDData_0_8' TO N'E:\Historian1\DB\HistorianStorage_22.ndf',
26 MOVE N'PH_TlgARTData_0_69' TO N'E:\Historian1\DB\HistorianStorage_23.ndf',
```

Result

The SQL query is adapted to the new storage location.

6 Appendix

6.1 Service and Support

Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks at:

<https://support.industry.siemens.com/>

Technical Support

The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries with numerous tailor-made offers – ranging from basic support to individual support contracts. You send queries to Technical Support via Web form:

Technical Support via Web form:

www.siemens.com/industry/supportrequest.

Service offer

Our range of services includes, inter alia, the following:

- Product trainings
- Plant data services
- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog:

<https://support.industry.siemens.com/cs/sc>

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for Apple iOS, Android and Windows Phone:

<https://support.industry.siemens.com/cs/ww/en/sc/2067>

6.2 Links and Literature

Table 6-1

No.	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Link to this entry page of this application example https://support.industry.siemens.com/cs/ww/en/view/66579062
\3\	

6.3 Change documentation

Table 6-2

Version	Date	Modifications
V1.0	04/2017	First version