



IP DIRECTOR APPLICATION NOTE

SQL Server maintenance

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INTRODUCTION

This application note describes the entire SQL server configuration used with the EVS database. You can also find some troubleshooting tools described at the end of the document

IP Director 7.30 is compatible with SQL2008 R2 and SQL2016

SQL SERVER MAINTENANCE DATABASE BACKUP PLAN

It's important to regularly backup the media database to ensure data recovery.

Several backup plans could be implemented depending on the infrastructure used by IP Director.

A daily full backup is considered as the minimal backup strategy but the following procedure ensures an optimal recovery plan:

- > Full Backup every hour
- > Transaction Log Backup every 15 minutes

On the standard platform, a full backup takes less than 10 seconds (DB size:450 Mb => 2Sec/100Mb). Even if this backup operation uses a lot of disk resources, the backup window is so short that this kind of backup could be done every hour without any substantial performance loss.

To shorten the data loss window, a Transaction Log backup is launched every 15 minutes. This complementary backup ensures that we can recover all the data changes up to 15 minutes before the DB corruption.

All these backup files should be stored on a local disk with enough free space (typically on E:\DB_BACKUPS). The backup files retention period is configured to 4h. That means that 4 full backup files and 4h of transactions will be stored in the backup folder (it could be a lot of data).

The backup files can also be automatically copied to a network share to ensure that they are available if the SQL Server totally crashes. This file copy can be done with Robocopy and is included in the SQL toolkit.

INDEX OPTIMISATION

To keep the database performances at the highest level day after day, it's important to periodically rebuild the indexes defined on each table. This procedure can be done automatically with a SQL job and launched by SQLSERVERAGENT every night.

Index rebuild is a performance consuming process and should be avoided during production hours.

FULLTEXT CATALOGS REORGANIZE (IPD ONLY)

The IP Director database intensively uses the SQL fulltext catalogs to perform searches. In order to keep them optimized a night job will reorganize them every day at 04:10

SYSTEM DATABASES BACKUP PLAN

In order to complete the backup strategy, MASTER and MSDB must also be saved through a backup procedure.

MASTER and MSDB are usually small, their backup-up should be performed quickly.

A job will backup these two system databases every night at 03:00.

PROCEDURE

All these maintenance actions can be created with the Maintenance Tool contained in the DB Toolbar (installed by the SQLToolkit).

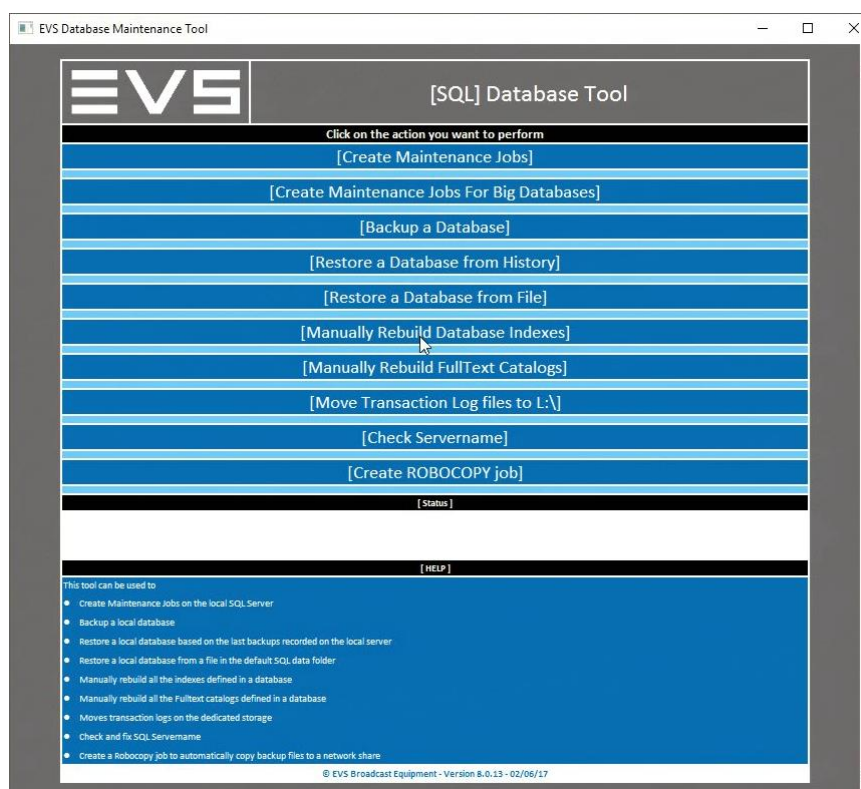


EVS MAINTENANCE TOOL

The EVS_DB_Tool is an HTA file (HTML Application).

It has been developed to easily perform administrative tasks on a SQL server .

These tasks are displayed in the following screenshot :



[CREATE MAINTENANCE JOBS]

This part of the tool creates the maintenance jobs explained in the first part of the document.

Jobs created are :

1. A DB Full backup every hour
2. A DB Transaction Log backup every 15 Minutes
3. A full DB Index rebuild every day at 02:00
4. Fulltext catalogs reorganize every day at 04:10 (only for IPD DB)
5. Bootstrapper Indexing Service every day at 1:23 (only for IPD DB 6.60-7.10)
6. The system database full backup every day at 03:00
7. A msdb database clean-up every day at 03:10
8. Errorlog cycle every week on sunday

[CREATE MAINTENANCE JOBS FOR BIG DATABASES]

This part of the tool creates the maintenance jobs for Big Databases.

Jobs created are :

1. A DB Full backup every hour
2. A DB Transaction Log backup every 15 Minutes
3. An optimized DB Index rebuild every day at 02:00
4. Fulltext catalogs reorganize every day at 04:10 (only for IPD DB)
5. Fulltext unlock indexing queues every 10 minutes (only for IPD DB)
6. Bootstrapper Indexing Service every day at 1:23 (only for IPD DB 6.60-7.10)
7. The system database full backup every day at 03:00
8. A msdb database clean-up every day at 03:10
9. Errorlog cycle every week on sunday

[BACKUP A DATABASE]

Creates a manual full or transaction log backup from the specified database

[RESTORE A DATABASE FROM HISTORY]

Restores a database from the lasts backups. The backup file list is obtained from the local SQL Server. It can be used to easily restore a previous version of the local database but not to restore a database coming from another server.

[RESTORE A DATABASE FROM FILE]

Restores a database contained in a backup file.

The database will be restored with its original name in the local server default directory.

This part of the tool is specially designed to restore databases coming from another server especially with different database folder path.

[MANUALLY REBUILD DATABASE INDEXES]

Rebuild all the indexes defined in the specified database

[MANUALLY REBUILD FULLTEXT CATALOGS]

Rebuild all FullText indexes defined in the specified database

[MOVE TRANSACTION LOG FILES TO L:]

Feature for DB model DBS1-4S (and newer) with a Tlog dedicated drive. If at least one database is restored with its transaction logs on the data drive, this option moves the logs to the Tlog drive (an alert is displayed in the Web Monitoring).

[CHECK SERVERNAME]

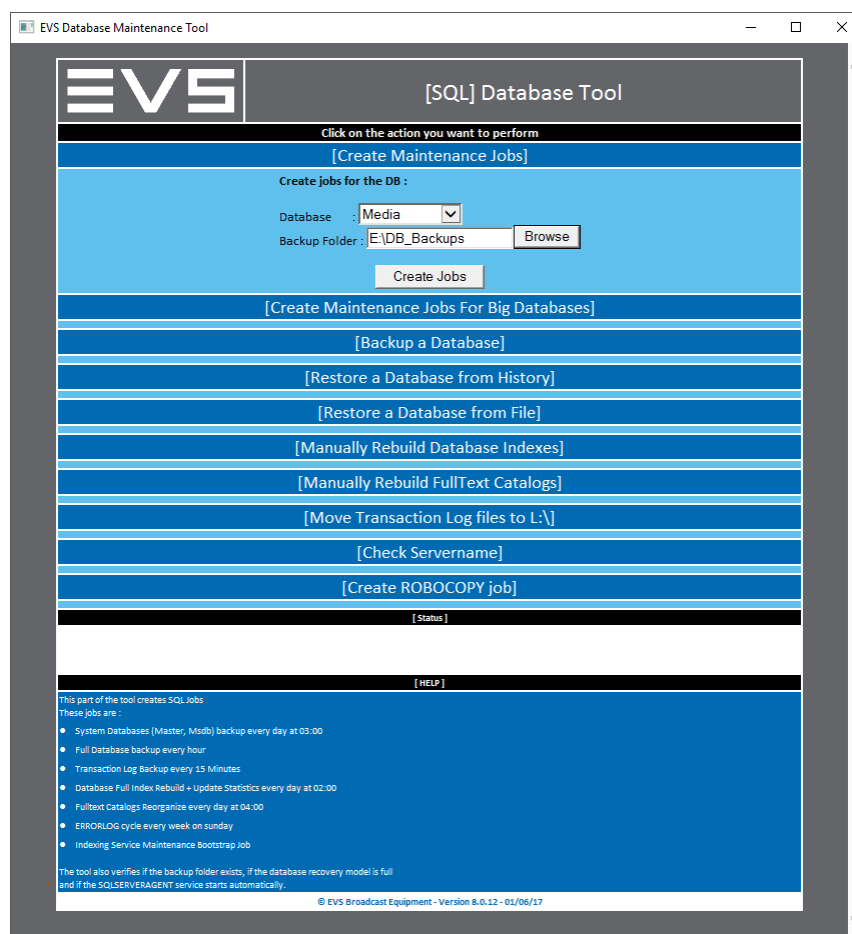
When changing the DB Server computer name, the @@Servername does not match the computer name anymore (an alert is displayed in the Webmonitoring). The method called 'drop/add server' was manually done before.

Now it's possible to ease this change with this new tool.

[CREATE ROBOCOPY JOB]

Creates a jobs that replicates a folder to a network share

[CREATE MAINTENANCE JOBS]



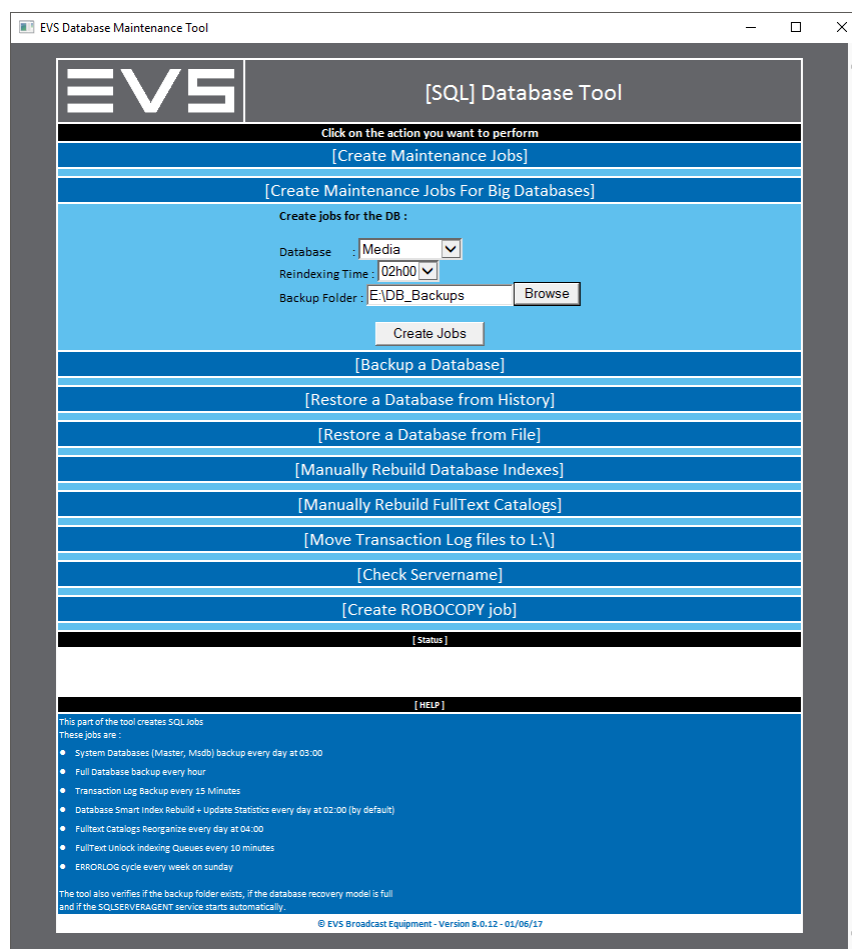
- > Click on [Create Maintenance Jobs] to display the tool options
- > Choose the database to “maintain” in the local database list
- > Choose the folder where the backups will be stored (default : E:\DB_Backups on DB Servers). The folder will be created if it doesn’t exist.
- > Click on “Create Jobs” to create the maintenance jobs for the chosen database.

The tool creates

1. A DB Full backup every hour
2. A DB Transaction Log backup every 15 Minutes
3. A full DB Index rebuild every day at 02:00
4. Fulltext catalogs reorganize every day at 04:10 (only for IPD DB)
5. Bootstrapper Indexing Service every day at 1:23 (only for IPD DB 6.60-7.10)
6. The system database full backup every day at 03:00
7. A msdb database clean-up every day at 03:10
8. Errorlog cycle every week on sunday

The Jobs created by the tool and their status can be listed in the SQL Server Management Studio in the SQL Server Agent tree, under the Jobs folder.

[CREATE MAINTENANCE JOBS FOR BIG DATABASES]



- > Click on [Create Maintenance Jobs For Big Databases] to display the tool options
- > Choose the database to “maintain” in the local database list
- > Change the Reindexing time (by default 2:00 AM)
- > Choose the folder where the backups will be stored (default : E:\DB_Backups on DB Servers). The folder will be created if it doesn't exist.
- > Click on “Create Jobs” to create the maintenance jobs for the chosen database.

The tool creates

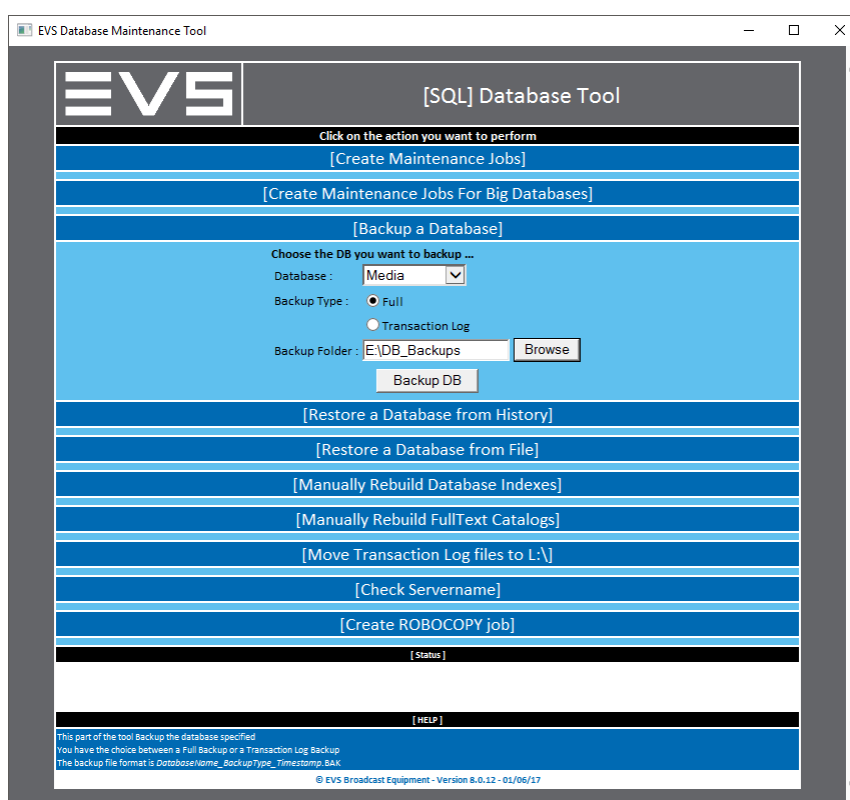
1. A DB Full backup every hour
2. A DB Transaction Log backup every 15 Minutes
3. An **optimized DB Index rebuild** every day at 02:00
4. Fulltext catalogs reorganize every day at 04:10 (only for IPD DB)
5. **Fulltext unlock indexing queues every 10 minutes (only for IPD DB)**
6. Bootstrapper Indexing Service every day at 1:23 (only for IPD DB 6.60-7.10)
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[BACKUP A DATABASE]

The EVS_DB_Tool can also be used to easily backup a database by choosing [Backup a Database]

- > Choose the Local Database name
- > Choose the database type (full or Transaction Log)
- > And Click on "Backup DB"

The backup file will be stored in the E:\DB_Backups folder by default or you can select another local folder on the DB server.



[RESTORE A DATABASE FROM HISTORY]

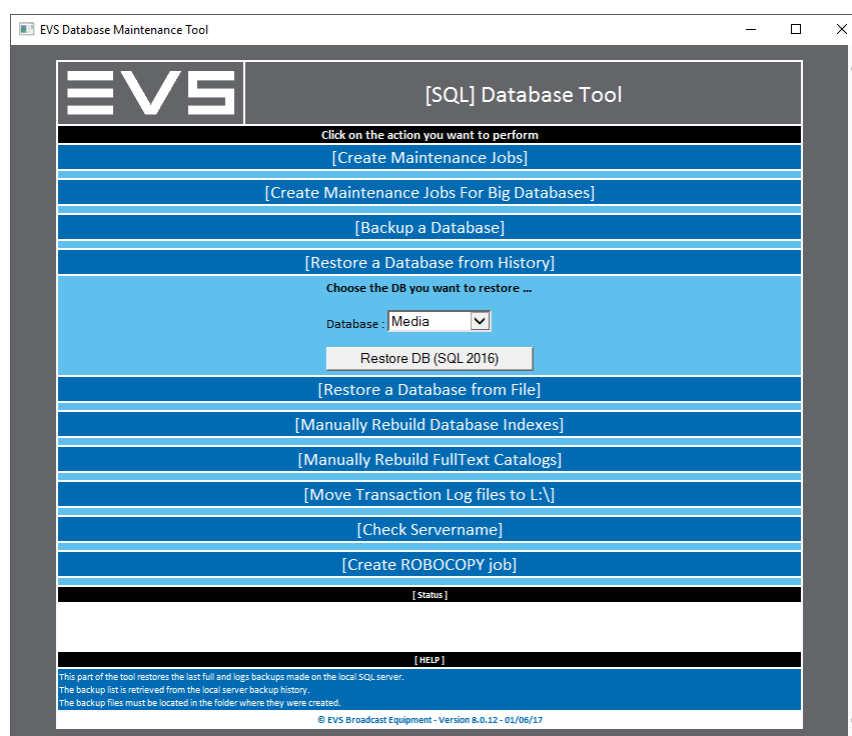
Two Restore types are available in this tool.

The first is based on the backup history stored on the local SQL server.

You have just to specify the local database to restore.

The tool will access the local SQL server and list the last backups performed on the database.

It then takes the last full database backup and the following transaction log backups and restores them on the specified database.



This first restore tool is designed to restore a corrupted database from the last backups performed on this database (locally)

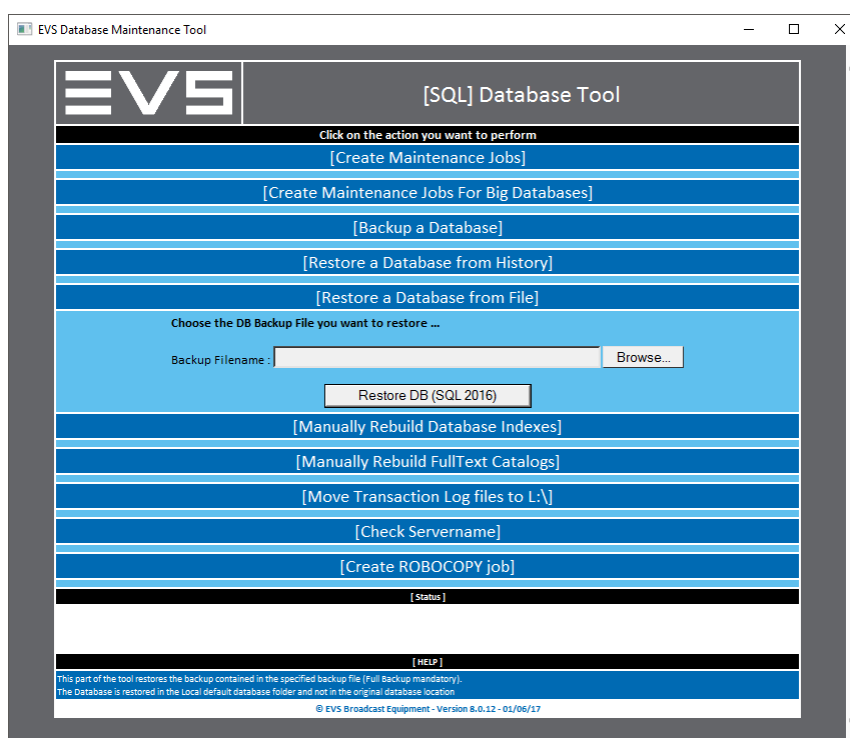
[RESTORE A DATABASE FROM FILE]

The second restore tool is based on a file restore and can be used to restore any database.

Browse to the local backup file (the entire file path).

The tool opens the backup file and reads the database name associated to the backup (only one backup must be stored in the file).

It restores this database in the local default database folder or on the local database location if it already exists (and not the originating file location stored in the backup file)



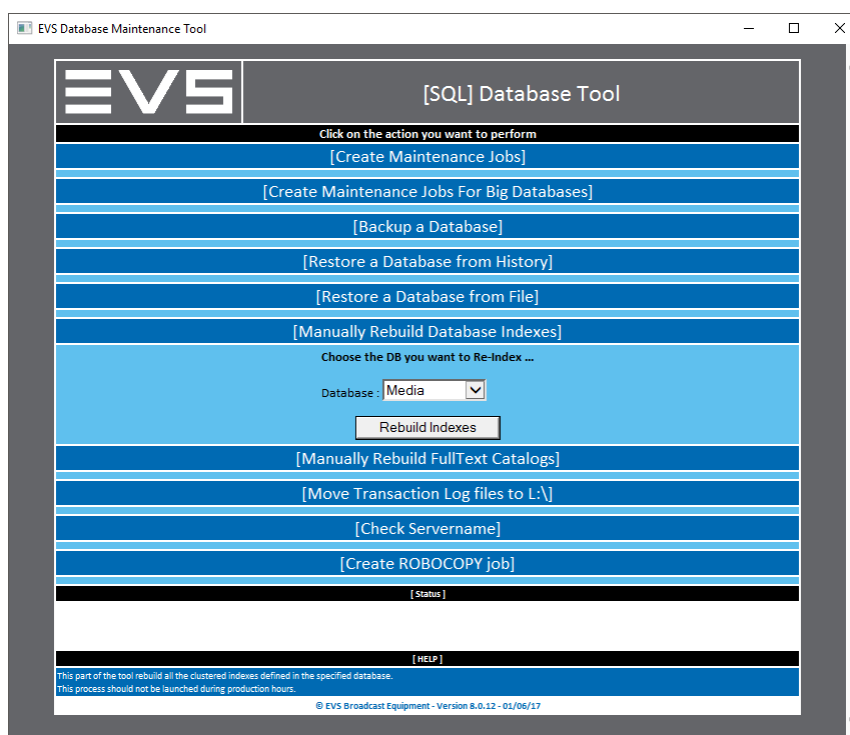
The tool is designed to restore a backup file whatever the database and the originate server configuration.

[MANUALLY REBUILD DATABASE INDEXES]

This part of the tool gives the opportunity to an operator to manually rebuild the database indexes. This operation is resource consuming and should be launched during low activity period otherwise it could cause locks and application slowdowns.

Index Rebuild can improve database performance by reorganising data in the database.

This functionality has been added to easily rebuild indexes when the corresponding maintenance job is disabled or not executed (regarding its schedule)



[MANUALLY REBUILD FULLTEXT CATALOGS]

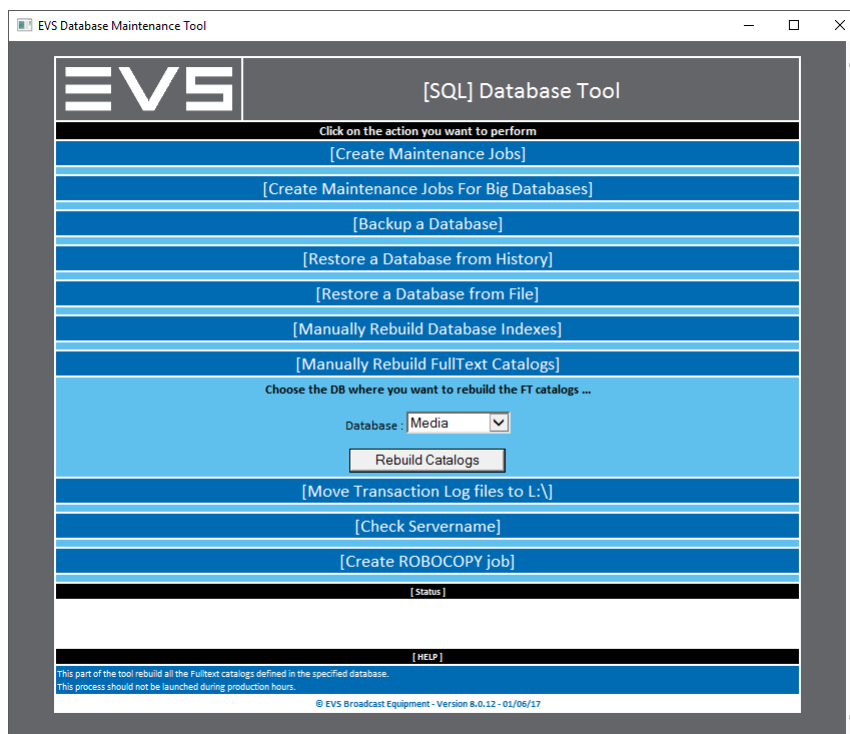
This tool is only dedicated for databases which have fulltext catalogs (meaning IPDirector for EVS).

IP Director 6+ uses the SQL Fulltext Search Engine to perform 'Google' like searches on the database.

The Fulltext Search Engine stores indexed words in the Fulltext Catalogs. These catalogs can then be rebuilt by this HTA.

You typically need to rebuild the Fulltext Catalogs on an IP Director database if :

1. You don't find anything when you search for a word in the IP Director Database Explorer but you find something when you search for **word**
2. You don't find your new clips containing the word you are searching for but you find the older ones.



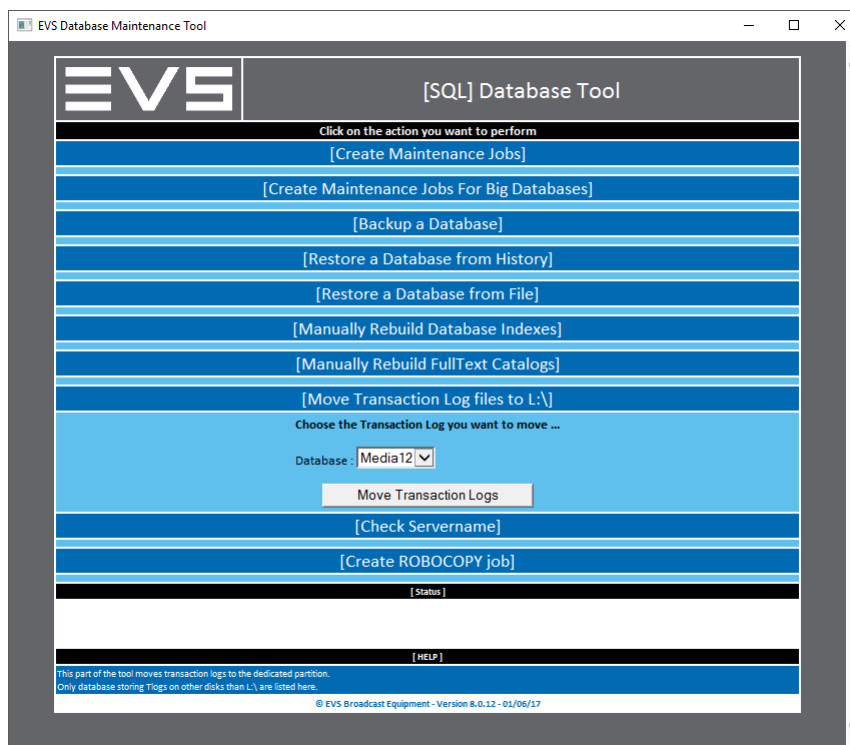
[MOVE TRANSACTION LOG FILES TO L:\]

Feature for DB model DBS1-4S (and newer) with a Tlog dedicated drive.

If at least one database is restored with its transaction logs on the data drive, this option moves the logs to the Tlog drive (an alert is displayed in the Web Monitoring).

[DB] Server monitoring : Media 12			
© EVS Broadcast Equipment - Version 2.04 - 01/06/17			
SQL Server configuration		SERVICES	
@@Version	Microsoft SQL Server 2016 (SP1-CU2) (KB4013106) - 13.0.4422.0 (X64) Mar 6 2017 14:18:16 Copyright (c) Microsoft Corporation Standard Edition (64-bit) on Windows Server 2016 Standard 6.3 (Build 14393;)		MSSQLSERVER Started
@@ServerName	Max DOP	4	Backup Compression YES
Program Dir	C:\Program Files\Microsoft SQL Server\MSSQL13.MSSQLSERVER\MSSQL\Binn\	Data Dir	T:\SQL\MSSQL13.MSSQLSERVER\MSSQL\DATA\
TempDB Dir	T:\SQL\MSSQL13.MSSQLSERVER\MSSQL\DATA\	Tlog Dir	L:\SQL\MSSQL13.MSSQLSERVER\MSSQL\DATA\
		Full-text Filter Daemon EVSDBIP Started	

Then the tool will list the faulty database(s):

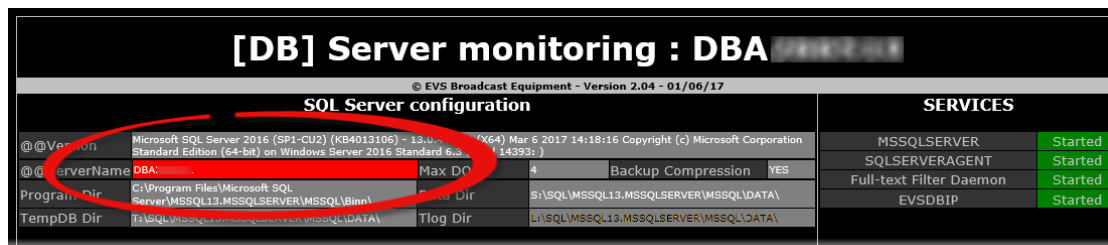


But most of the time, the restore tools will create the Tlog file on the dedicated drive:

[Move Transaction Log files to L:]
All Databases Transaction Logs are correctly stored.

[CHECK SERVERNAME]

When changing the DB Server computer name, the @@Servername does not match the computer name anymore (an alert is displayed in the Webmonitoring).

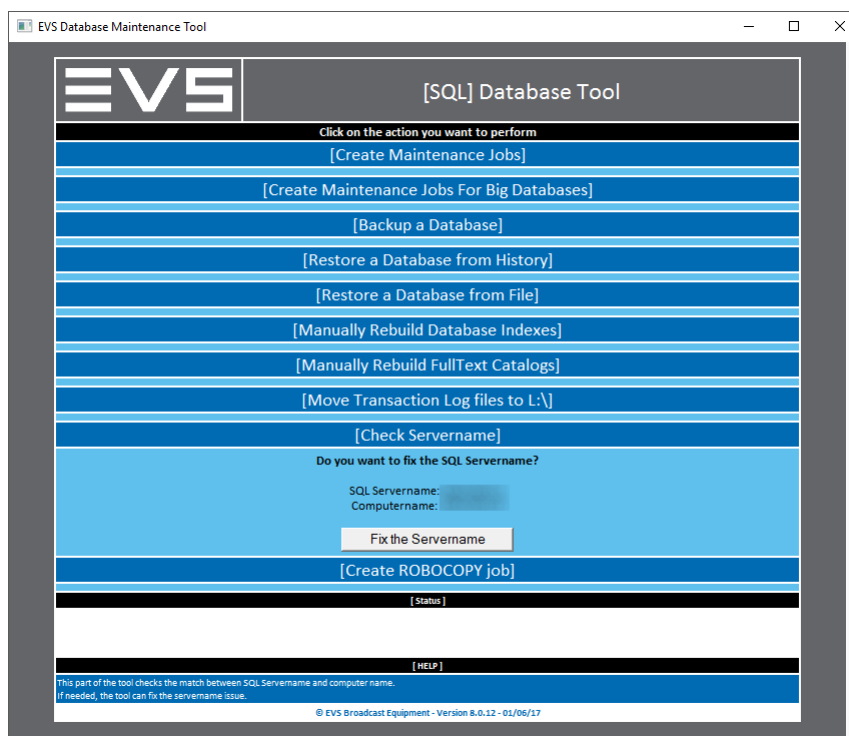


The method called 'drop/add server' was manually done before:

- SP_DROPSEVER 'DBAXXXXXX'
- SP_ADDSERVER 'EVSDBP', local
- Restart fo SQL Server services

Now it's possible to ease this mandatory change with this new tool.

The tools displays the wrong SQL server name and the target computer name.



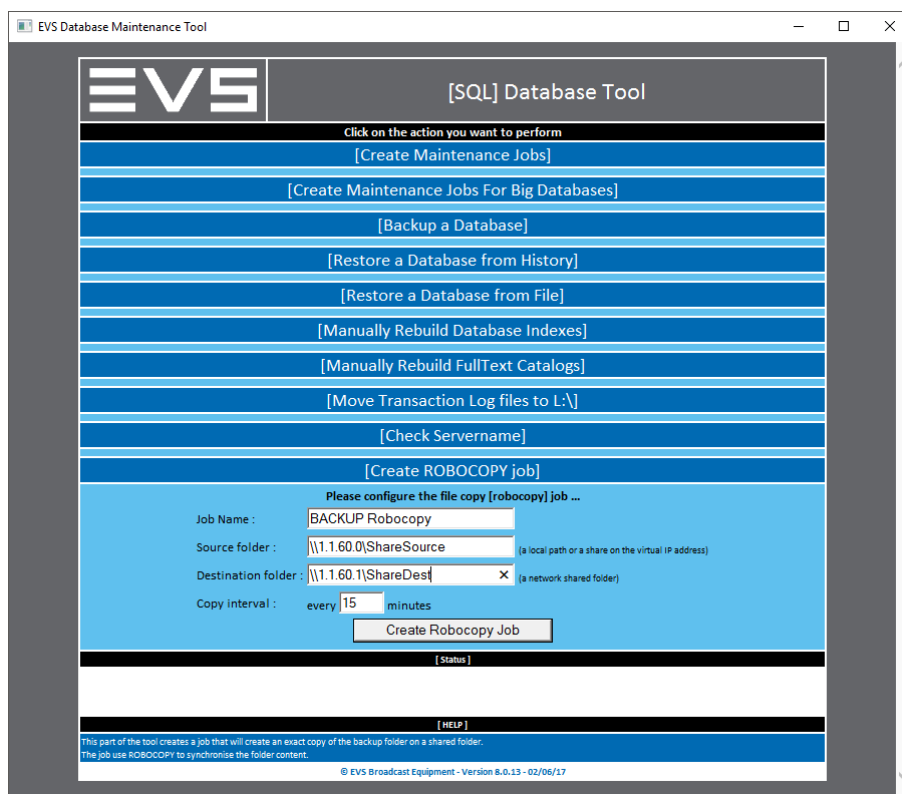
Press the button 'Fix the Servername' to fix the issue. Then server can be restarted with a button in the status zone.

But most of the time, the servername matches the computer name and this message is displayed:



[CREATE ROBOCOPY JOB]

This part of the tool gives the opportunity to create a job that replicates files between a local drive and a network share



Remark : the "SQLServer" user must exist on the destination server or must be recognized by the destination folder

The Robocopy job can be used to replicate files between mirrored DB Servers.

In this case, the jobs should be created on both servers (main and backup) and have the following source and destination paths:

Source folder : \\Virtual_IP_Address\Share

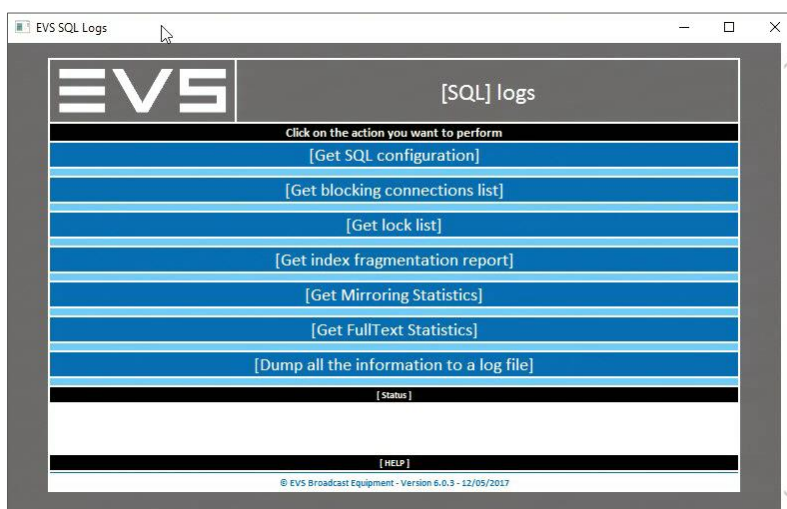
Destination folder : \\Local_IP_Address\Share

EVS SQL INFO & LOGS

The "SQL Info & Logs" tool retrieves the major monitoring information related to an IP Director database.



You can either perform each operation one by one or either launch them all at once and store their result in a log file, with the last option.



[GET SQL CONFIGURATION]

This option retrieves the version of the SQL server used by IP Director

[GET BLOCKING CONNECTIONS LIST]

This option tries to list the connection that blocks other connections.

If you detect blocking connections, click several times on the [Get blocking connections list] menu to verify that the blocking connection disappears by itself.

A blocking connection is not necessarily an issue and is part of the normal behaviour on a loaded DB server.

However, if the same blocking connection stays for a long period of time (typically more than a minute), it could become a real issue for IP Director and it could explain misbehaviours in IP Director.

[GET LOCK LIST]

This option list the locks asked by the connections on the SQL objects.

This list can be really big on loaded servers.

[GET INDEX FRAGMENTATION REPORT]

The option performs a check on the database you have selected in the list to detect if indexes are fragmented.

[Get index fragmentation report]

Please choose the database you want to analyse ...

Database :

The result shows several statistics for all tables defined in the database.

[Status]											
DBCC SHOWCONTIG											
ObjectName	Rebuild	IndexName	IndexId	Rows	Pages	Extents	Extent Switches	Scan Density	Best Count	Actual Count	Logical Fragmentation
KeywordGridAccess		PK_KeyWordGridAccess	1	4	1	1	0	100	1	1	0
GroupVarID		PK_GroupVarID	1	0	0	0	0	100	0	0	0
LogsheetAssetMaterialID			0	18646	81	18	17	61.11	11	18	77.78
Log		PK_Log	1	14	1	1	0	100	1	1	0
TC2Field			0	180	5	5	4	20	1	5	60

Some of them will be highlighted in colour to reflect the size and the fragmentation of the table.

RemoteBSendToList		PK_RemoteBSendToList	1	0	0	0	0	100	0	0	0
TargetToDo			0	0	0	0	0	100	0	0	0
BinElem	rebuild	PK_ElemBin	1	44863	179	33	53	42.59	23	54	26.82
ConfigGPI			0	0	0	0	0	100	0	0	0

If a table is identified as too fragmented, a “rebuild” link will be added next to the table name.

Pressing this link will rebuild the indexes on the table.

[GET MIRRORING STATISTICS]

This option gives statistics for database in mirroring state.

[Get Mirroring Statistics]

Please choose the database you want to analyse ...

Database :

The statistics give information on :

- > The mirroring status
- > The connection with the witness
- > The mirror commit overhead (avg delay)

[Status]												
DB Mirroring Monitor Result												
DBName	Role	Mirroring State	witness status	log gen rate	unsent log	send rate	unrestored log	recovery rate	tran delay	tran per sec	avg delay	local time
Media_	1	In Sync	No	44	0	44	0	0	14	47	0	10/25/2012 5:06:11 PM
Media_	1	In Sync	No	54	0	54	0	0	15	42	0	10/25/2012 5:05:55 PM
Media_	1	In Sync	No	35	0	35	0	0	14	46	0	10/25/2012 5:05:39 PM
Media_	1	In Sync	No	36	0	36	0	0	30	45	0	10/25/2012 5:05:23 PM

If the mirror commit overhead (avg delay) is constantly higher than 10-30, it reveals a performance issue on the mirror server and it could highly impact the performances of IP Director

[GET FULLTEXT STATISTICS]

This option gives fulltext indexing statistics for IP Director databases.

It mainly shows, for each indexed table, the number of row processed by the Fulltext engine and the size of the indexing queue (pending changes).

The “pending changes” reveals the number of data modification that are not applied to the fulltext index yet.

[Get FullText Statistics]

Please choose the database you want to analyse ...

Database :

Get FullText Stats

[Dump all the information to a log file]

[Status]									
FullText Indexing Stats									
Cat Name	Table Name	Is Enabled	Population Status	Change Tracking	Item Count	Doc Processed	Pending Changes	Nbr failure	Unique idx name
FT_Cat_Media	Bin	True	Idle	Auto	24	0	0	0	PK_Bin
FT_Cat_Media	Category	True	Idle	Auto	1	0	0	0	PK_Category
FT_Cat_Media	Keyword	True	Idle	Auto	294	0	0	0	PK_KeyWord
FT_Cat_Media	LogsheetMetaProfile	True	Idle	Auto	0	0	0	0	PK_LogsheetMetaProfile
FT_Cat_Media	Media	True	Idle	Auto	15395	0	0	0	PK_VirMedia
FT_Cat_Media	MediaItem	True	Idle	Auto	15527	0	0	0	PK_Media
FT_Cat_Media	Playlist	True	Idle	Auto	26	0	0	0	PK_Playlist

If you see the “pending changes” value constantly increasing (and never decreasing) it could mean that the fulltext indexing process is blocked.

If the indexing is blocked, new objects inserted in the database (i.e. new clips created in IPD) will never be returned by a search (typically a search in the DB explorer).

[DUMP ALL THE INFORMATION TO A LOG FILE]

This option launches all tasks available in the tool and stores their result in a log file in c:\evslogs\.

This option can be useful to send monitoring result to EVS support team.