

DB SERVER APPLICATION NOTE

EVS Database Mirroring

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Corporate

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INTRODUCTION

This application note describes the EVS redundant Database server. How it works and how to install it.

MIRRORING PRINCIPLES SQL 2005 MIRRORING

Database mirroring is a new SQL Server 2005 technology available for increasing database availability.

In database mirroring, an originating SQL Server 2005 instance continuously sends a database's transaction log records to a copy of the database on another standby SQL Server instance. The originating database and server have the role of *principal*, and the receiving database and server have the role of *mirror*. The principal and mirror servers must be separate instances of SQL Server 2005.

In addition to the two partner servers (principal and mirror) a database mirroring session may have an optional third server, called the *witness*. The witness server's role is to enable automatic failover. When database mirroring is used for high availability, if a principal server suddenly fails, if the mirror server has confirmation from the witness, it can automatically take on the role of principal and make its database available within a few seconds.

The principal and mirror servers must run at least SQL Server 2005 Standard Edition. The witness server can run SQL Server 2005 Express Edition.

More information about SQL Mirroring is available on : http://www.microsoft.com/technet/prodtechnol/sql/2005/dbmirror.mspx

VIRTUAL IP ADDRESS

SQL Server 2005 doesn't manage the clients redirection in case of failover. We have then developed a windows service that links an IP Address to the mirrored database. This service is called EVSDBIP.

EVSDBIP is installed on the Principal and mirror servers. It regularly queries the SQL server to check the mirroring status and the mirrored database state. If EVSDBIP runs on the principal server, it adds the virtual IP Address to the local TCP/IP stack. If EVSDBIP runs on the mirror server, it checks that the virtual IP Address is not configured on the server and eventually removes this IP Address from the local TCP/IP stack.

In case of failover, the server roles (principal and mirror) are switched. The Virtual IP is removed from the "old" principal server (if it is still available) and added to the "New" principal server.

EVSDBIP can manage multiple Database/IP links on the same servers. This means that multiple databases can be mirrored on the same couple of server, each database with its own virtual IP address.

EVS DATABASE MONITORING

The EVSDBIP service doesn't provide user interface to verify mirroring configuration and availability.

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The tool "EVS Database Monitoring" has been developed to periodically display the EVSDBIP status on principal and mirror server.

'S Database Monitoring	
Configuration Refresh Log	s Help
Database monitored	
IpRemote	-
Servers	
SERVER 1	SERVER 2
DB60100	DB60110
Servers Status	
PRINCIPAL	MIRROR
SQL Mirroring Status	
MIRROF	RING OK
SYNCHRONIZED	SYNCHRONIZED
Virtual IP Address	
1.1.2.180	1.1.2.180
4/2/2007 2:47:23 PM	4/2/2007 2+47+23 PM

This application verifies the EVSDBIP status and the mirroring state on each SQL server and displays the result in an "easy to use" interface. "EVS Database Monitoring" can be installed on any Windows XP/2003 computer on the network.

More information about this application is available later in this document.

MIRRORING INSTALLATION INTRODUCTION

Database redundancy installation is divided into several steps :

- > SQL Server 2005 installation
- > EVSDBIP installation and configuration
- > EVS Database Monitoring installation and configuration
- > Database Mirroring initialisation

SQL SERVER 2005

SQL Server 2005 must be installed on

- > the principal server (where the database will be used)
- > the mirrored server (the backup server)
- > the witness computer (workstation used for automatic failover)

SQL Server 2005 Standard Edition (or Enterprise Edition) must be installed on principal and mirror servers. SQL Server 2005 Express Edition (or higher) can be installed on the Witness workstation.

At least SQL Service Pack 1 must be applied on each server, DB mirroring is not supported for earlier versions.

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EVSDBIP

EVSDBIP must be installed on the principal AND the mirror server. (not on the witness)

EVSDBIP is a windows service. It can be installed with the setup file : EvsDblp_setup 02.07.00.exe

No special configuration is asked during the setup process.

EVSDBIP is configured through an INI file and the setup application will ask you to configure this INI file before the end of the setup.

By default, the ini file contains this configuration :

; config file for "EvsDblp" service ; please refer to "EVSDBIP_analyse.doc" MSWord document to get detailed info

[EVSDBIP]

; adress static of this server StaticIP=1.1.2.178

; login to master DB DBLogin=sa

; password to master DB DBPassword=evs

; port to use for communications with clients Port=10555

; settings for CleanEdit ;[CleanEdit] ;VirtualIP=1.1.2.181 ;RefIP=1.1.2.178 ;DbName=CleanEditDB

; settings for IpRemote [IpRemote] ; virtual IP to access IpRemote DB VirtualIP=1.1.2.180

; IP of adapter to which virtual IP has to be attached RefIP=1.1.2.178

; name of DB DbName=IpRemoteWC

The options contained in the ini file are described in the following table :

Option	Description
[EVSDBIP]	General configuration category
StaticIP	IP address of the managed server (typically local IP or 127.0.0.1)
DBLogin	SQL Server Login (typically : SA). This login is used to verify mirroring state
DBPassword	Password of the SQL Server Login
Port	TCP port used to make EVSDBIP status available to client ("EVS Database Monitoring"). By default : 10555

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[XYZ]	Category where is described an association "Database / IP Address" to monitor. Typically XYZ = Database name. You can create as much category as the number of database configured on your server.
VirtuallP	Virtual IP Address added to the server where the database is principal (for the XYZ category)
RefIP	Reference IP address (for the XYZ category), used to locate the network interface where the Virtual IP will be attached (don't put 127.0.0.1 for this option)
DbName	Name of the mirrored database to monitor (for the XYZ category)

The ini file can be limited to :

[EVSDBIP] StaticIP=127.0.0.1 DBLogin=sa DBPassword=evs Port=10555 [IpRemote] VirtuaIIP=1.1.2.180 RefIP=1.1.2.178 DbName=IpRemote

Restart your server to make EVSDBIP running (or manually start the EVSDBIP service)

EVSDBIP logs are stored in c:\EVSLogs\EVSDBIP\

EVS DATABASE MONITORING

INSTALLATION

"EVS Database Monitoring" monitors the state of the EVSDBIP service on the principal and the mirror server.

This application can be installed on any Windows XP/2003 computer on the network.

- > .NET framework 2.0 is needed to install the application
- > "EVS Database Monitoring" setup file is EVS Database Monitoring Setup.msi

CONFIGURATION

The first time you launch "EVS Database Monitoring", nothing will be displayed in all the monitoring area. The first step to complete is to configure the databases you want to configure.

To perform this configuration:

- > Choose "Databases" in the "Configuration" menu
- > Press the "Add" button to add a database to monitor
- > Complete the following configuration
 - > Database Server 1
 - > Server Name : Computername of the server or its IP address
 - EVSDBIP Port : by default 10555 (modify if it has been changed during the EVSDBIP installation)
 - EVSDBIP Log File : browse to the file C:\EVSLog\EVSDBIP\EvsDbIp.log on the database server Database Server 2
 - > Server Name : Computername of the server or its IP address

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- > **EVSDBIP Port** : by default 10555 (modify if it has been changed during the EVSDBIP installation)
- > EVSDBIP Log File : browse to the file C:\EVSLog\EVSDBIP\EvsDblp.log on the database server
- > General
 - Database Name : name of the database monitor. Must be the same as the category name in the EVSDBIP configuration file (i.e. [XYZ] in the above explanation)
 - Refresh interval : time between 2 status polling on the EVSDBIP services. Cannot be less than 2 seconds.

tabase Configuration	
Database Server 1 Server Name DB60100 EVSDBIP Port 10555_ EVSDBIP Log File Browse.	General Database Name IpRemote Refresh Interval 5_ Seconds
Database Server 2 Server Name DB60110 EVSDBIP Port 10555	
EVSDBIP Log File Browse	Save Cancel Apply

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INTERFACE

Once the databases have been added to the configuration you can choose the database you want to monitor in the first dropdown list. Only one database can be monitored by "EVS Database Monitoring" application. You can launch as many applications as you want depending on the database number you have.

Configuration Refresh Logs	Help
Database monitored	
charge	~
Servers	050150.0
SERVER I	SERVER 2
1/2.22.200.201	1/2.22.200.202
Servers Status	
PRINCIPAL	MIRROR
SQL Mirroring Status	
MIRROF	RING OK
SYNCHRONIZED	SYNCHRONIZED
Witness Status	
Witness disconn	ected on server 2
IPDIRECTOR-1	IPMaMachine1
Virtual IP Address	
172.22.200.200	172.22.200.200

The application interface is described areas by areas in the following points

SERVERS AREA

This part of the interface shows the name of the servers involved in the mirroring process

SERVERS STATUS AREA

This part of the interface shows the status of the EVSDBIP service on the 2 database servers and the role played by each server in the mirroring process.

The meaning of the colours used as background is explained in the following table.

	SERVERS STATUS	
Colour	State	Comments
Server Role	Connected to EVSDBIP	The application is connected to EVSDBIP and has received the service status.
Server Role	Connected to EVSDBIP with warnings	The application is connected to EVSDBIP but has encounter a problem (No status, Database not configured on EVSDBIP,)
Server Role	Not connected to EVSDBIP	Not connected to EVSDBIP (server unavailable, wrong port, service stopped or not responding,)

SQL MIRRORING STATUS AREA

Here is displayed the mirroring status returned by SQL 2005 on each server.

A first "coloured" area summarise the two SQL status to display a clear global status of the mirroring process.

The meaning of the text displayed in the two other areas is explained in the following table .

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SQL Mirroring Status	
Text displayed	Status
Suspended	Mirroring the principal database is suspended.
Disconnected	The principal database and the mirror database are disconnected.
Synchronizing	The principal database and the mirror database are in the process of synchronizing
Pending Failover	The principal database is initiating a failover.
Synchronized	The principal database and the mirror database are synchronized.
Database is not online	The principal database is not mirrored.
blank	Not connected to EVSDBIP

WITNESS STATUS AREA

This area displays the status of the witness connection from both DB servers

"VIRTUAL IP ADDRESS" AREA

Shows the Virtual IP Address configured on each database server and how this IP Address is handled. The colour coding used in this area is explained in the following table.

	Virtual IP Address
Colour	Status
IP Address	The IP address is not added to the «mirror » server
IP Address	The IP address is still present on the « Mirror » server
IP Address	The IP address is configured on the « Principal » server
IP Address	The IP address is not configured on the « Principal » server yet.
Blank	No status is returned

STATUS BAR

The status bar shows when the last EVSDBIP status has been received on each server.

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MIRRORING INITIALISATION

The database mirroring can be initialized through different applications.

- > SQL Server Management Studio
- > EVS-DB-Mirroring-Setup.hta in the [IP] Director plugins or on the [DB] Server

EVS-DB-Mirroring-Setup has been developed to easily create a database mirroring. This tool is described later in this document.

If you want to use SQL Server Management Studio you must first prepare your SQL environment:

- > Verify that your database is in "Full" recovery mode
- > Backup the database
- > Backup the transaction Log of the database
- > Restore the database on the mirror server with the "norecovery" option
- > Restore the transaction Log on the mirror with the "norecovery" option
- Create a database on the witness server with the same name than the one you want to mirror (for example : IpRemote)
- In the SQL Server Management Studio, right-click on the database you want to mirror and choose "Tasks" -> "Mirror..." and complete the configuration through this wizard.

More information about using the SQL Server Management Studio to mirror a database is available on : <u>http://msdn2.microsoft.com/en-us/library/ms188712.aspx</u>

PERFORMANCE CONSIDERATIONS

You may experience mirror slowness on heavily loaded database server.

Following our experience the slowness mainly comes from the "mirror commit overhead", the number of milliseconds added to each transaction by the synchronous mirroring process.

If you think you experience this kind of slowness it's important to verify the effective mirror commit overhead you have on your database servers.

How to verify the "mirror commit overhead" :

- > Start the "SQL Management studio" and connect to your database server
- > Right-click on your database, choose "Tasks" "Launch Database Mirroring Monitor"



> Register a new mirrored database



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inored d	stabases:		
legister	Database	Current Role	Partner (Connect As)
	tilumine Mandau - B	dan single by the second	n the nutries of the adapted databases

> Connect to your server and choose the database you want to monitor

Server type:	Database Engine
Server name:	122222800800 ·
Authentication	Windows Authentication
User name:	BIGSETUPIOVB
Password	

	anne jaboseto		<u> </u>
legister	Databases on dbt9910:	Current Role	Partner (Connect As)
Г	FTAsset	Mirror	DB60810 (Windows Authentication of
-	Media	Principal	DB60810 (Windows Authentication of

> Wait a few seconds and verify the value of the mirror commit overhead



> You can also check if your mirror commit overhead is constant in the time by checking the history of the principal server.

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erver instance:	DB	59810			Databa	51E		Me	dia			
iter list by:	Last two hours				•	Retreuh						
jstory:		1		Lu				Law	1		1	
I me Hecorded	Hole	Mito	With	Unse	1 100	Send	New	Uide	Unre	1 ma	Hest.	Minor Commt Uverhead
7/9/2010 11:49:32 AM	Pinc.	Sync		UKB		UKB	UKB	00:0	UKB		UKB	Umiliseconds
7/9/2010 11:49:01 AM	Princ	Sync		0 KB		0 KB	0 KB	00:0	0 KB		0 KB	0 milliseconds
7/9/2010 11:48:20 AM	Pinc_	Sync		0 KB		0 KB	0 KB	00.0	0 KB		0 KB	0 milliseconds
7/9/2010 11:48:01 AM	Princ	Sync		0 KB		0 KB	0 KB	00.0	0 KB		0 KB	0 milliseconds
7/9/2010 11:47:50 AM	Princ	Sync		0 KB		0 KB	0 KB	00.0	OKB		0 KB	0 milliseconds
7/9/2010 11:47:21 AM	Princ	Sync		0 KB		0 KB	0 KB	00.0	0 KB		0 KB	0 milliseconds

The mirror commit overhead should always stay below 10ms and have an average of 3 or 4 ms.

If you see that your mirror commit overhead most of the time above 30 ms you may consider to upgrade the backup server.

This mirror commit overhead is often caused by disks bottlenecks on the backup server. (you verify this bottleneck by checking the "Average Write disk queue length" of the S drive in the performance monitor)

One way to solve this is to change the RAID configuration of the DATA drive from a RAID1 to a RAID10 or RAID5.

If you are experiencing this kind of issue contact the EVS support to check if an upgrade is possible.



EVS DB MIRRORING SETUP TOOL

The EVS-DB-Mirroring-Setup is a small HTA file (HTML Application).

It has been developed to easily perform administrative tasks related to DB mirroring on SQL Server 2005. The tool should be used locally on the SQL server.

The available administrative tasks are displayed in the following screenshot :



> [Setup DB Mirroring]

Initiate database mirroring between two SQL 2005 servers and configure the witness workstation

- [Stop DB Mirroring]
 Stop Database mirroring
- [Failover DB Mirroring]
 Initiate a manual failover. Mirroring roles will be switched between the two SQL servers.
- [Add Witness to DB Mirroring]
 Configures a witness on a mirrored database and enables the automatic failover.
- [Remove Witness from DB Mirroring]
 Removes the witness in the current mirroring configuration and disable automatic failover.
- [Restore Mirrored DB]
 Restores a database locked by a mirroring process, from a backup file.

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[SETUP DB MIRRORING]



- > Click on [Setup DB Mirroring] to display the tool options
- > Choose the database to mirror in the local database list
- > Configure the first SQL Server name (typically local server name)
- > Configure the second SQL Server name (mirror)
- > Configure the Witness server name (SQL 2005 Express SP1 must be already installed)
- > Click on "Mirror DB" to start the mirroring.

The tool executes the following steps :

- > Check the DB recovery model and configure it to "Full"
- > Create a DB Full backup on the principal server
- > Create a transaction log backup on the principal server
- > Restore the Full backup on the mirror server (with norecovery)
- > Restore the Transaction Log backup on the mirror server (with norecovery)
- > Create mirroring endpoints on principal, mirror and witness servers
- > Start the mirroring process
- > Add records to Hosts file on DB Servers and Witness

The witness field is not mandatory. If no witness is configured at this step, mirroring will be installed without automatic failover.

[STOP DB MIRRORING]

The HTA can also be used to stop the mirroring applied to a local database.

The tool will list the mirrored databases on your server.

You will be able to choose a mirrored database and click on "stop mirroring".

This action will definitely stop the data replication process and will remove the virtual IP managed by EVSDBIP

ESQL] Mirroring Setup [Setup DB Mirroring] [Stop DB Mirroring] 1. Obuse the mirror yau want to stop Database, [Sepands Database, [Sepands Bits Minering] [FallOver DB Mirroring] [Remove Witness from DB Mirroring] [Restore Mirrored DB] [Restore Mirroring 4.42-11/11/17			
[Setup DB Mirroring] [Stop DB Mirroring] 1. Choose the mirror you went to stop Database []wRenote] Btop Mineting [FallOver: DB Mirroring] [Remove Witness from DB Mirroring] [Remove Witness from DB Mirroring] [Restore Mirrored DB] [Comp] 0.001 Breadeat Sequented - Vertice 1.4.2-11/16/27	EÝS	[SQL] Mirroring Setup	
[Stop DB Mirroring] 1. Obuste the mirror you want to stop Database []sPennote *] Etop Mineing [FallOver: DB Mirroring] [Remove Witness from DB Mirroring] [Remove Witness from DB Mirroring] [Restore Mirrored DB] [step] 0191 Breadeat Septement - Vectore 1.42-11/18/27		[Setup DB Mirroring]	
I. Choose the miror year want to stop Database [VPennov = Database [VPennov = [PailOver DB Mirroring] [Remove Witness from DB Mirroring] [Restore Mirrored DB] [Restore Mir		[Stop DB Mirroring]	
Database []Feendo = Stop Microsing (FailOver D & Microsing) (Remove Witness from DB Microsing) [Restore Microsed DB] [Restore Microsed (Micro] 0.899 Resolucit Equations 4.42-18/18/89		1. Choose the mirror you want to stop	
StopMoving [FailOver DB Mirroring] [Remove Witness from DB Mirroring] [Restore Mirrored DB] [Status] Status] O SYS Residuat Equinment - Version 1.42 - 13/13/47		Database : l'pRemote •	
[FairOver UB Mirroring] [Remove Witness from DB Mirroring] [Restore Mirrored DB] [stance] 0 895 Broadcast Equipment - Vacion 4.42 - 19/19/97		Stop Minoring	
[Remove Withess from DB Mirroring] [Restore Mirrored DB] [stree [stree] 0.099 Residual Equipment - Vacion L42 - 19/19/97		[FallOver DB Mirroring]	
[Resource Number 2016] [Steep] 0.195 Resolucit Equations (Victor L42 - 15/15/87		[Remove Witness from DB Mirroring]	
0.075 Broadcast Equipment - Yorcion 4.4.2 - 19/19/47		[Restore Mirrored DB]	
EV5 Breadcast Equipment - Version 4.4.2 - 19/10/07		20005	8
© EVS Broadcast Equipment - Vorsion 4.4.2 - 18/10/07	14.93	THELP 1	
	8	© EVS Broadcast Equipment - Version 4.4.2 - 18/10/07	8

[FAILOVER DB MIRRORING]

This option can be used to manually switch the server roles.

The principal server will become the target of the mirroring (the mirror) and the mirror will become the principal server. EVSDBIP will then move the virtual IP address from the first server to the "new" principal server. The clients will be disconnected from the database during +/- 20 seconds.

[Setup DB Mirroring] [Setup DB Mirroring] [FallOver: DB Mirroring] 1. Choose the mirror you went to FallOver Database [SPance ≥ Follow Minose [Remove Witness from DB Mirroring] [Restore Mirrored DB] [Restore Mirrored DB] [Restore Mirrored DB] [Restore Mirrored DB] [Restore Mirrored DB] [Restore Mirrored DB]	EVS	[SOI] Mirroring Setup
(Setup DB Mirroring) [Stop DB Mirroring) [FailOver DB Mirroring) 1. Choose the mirror you want to FailOver Outsides [Senote 3] [Remove Withess from DB Mirroring] [Restore Mirrored DB] [Restore Mirrored DB] [URC] (URC)		[DQL] Hirroring Decup
[Sbop DB Mirroring] [FailOver DB Mirroring] L.Choose the mirror you went to Failover Dutabase [Orlenote = FailOver Mercing] [Remove Withoses from DB Mirroring] [Restore Mirrored DB] [Wees] [WE9] (PT Brockast Equipment - Venim -4.42 - 19/18/97		[Setup DB Mirroring]
[FailOver DS Mirroring] L:Choose the mirror you want to FailOver Dutabase [c=Remote = FailOver Mirroring] [Remote Witness from DB Mirroring] [Restore Mirrored DB] [Restore Mirrored DB] [Restore Mirrored DB] [Restore Mirrored DB] [Restore Mirrored DB]		[Stop DB Mirroring]
1. Choose the mitror you want to Fallover Database [Fellow Merces] [Remove Withness from DB Mirroring] [Restore Mirrored DB] [R		[FailOver DB Mirroring]
Databas : [vPlanck * Fall/set Mening] [Restore Withness from DB Mirrored DB] [Restore Mirrored DB] [MAN] (MAN) (MAN)		1. Choose the mirror you want to FailOver
Fail/ver Minoring [Remova Witness from DB Minoring] [Restore Minored DB] [Restore Minored DB] [Restore Minored DB] [Restored DB] [Restored DB] Restored DB] 0 EVE Brookast Explorement-Version 4.4.2 - 13/18/09		Database : lipRemote 💌
[Remove Witness fram DB Mirroring] [Restore Mirrored DB] [Restor [RetD] 0.076 Bookast Epigment Version 64.2 : 17/16/07		FailOver Mirroring
[Restore Mirrored DS] [Units] [UII:P] @171 Brockast Epigmont - Version 4-L2 - 13/18/07		[Remove Witness from DB Mirroring]
(1990) (1990) (1992) (1993) (1		[Restore Mirrored DB]
(† 112.) 0 PFI Brokart Epipenost - Varien 44.2 - 17/10/07		[Statue]
(1982) () EVI Brockast Epigmunt - Venies -642 - 13/18/97		
0 EVS Broadcact Bydemont - Version 4.4.2 - 11/18/07		
		© EVS Broadcast Equipment - Version 4.4.2 - 18/10/07

If you click on "Failover Mirroring" you will be asked to confirm the operation.



[ADD WITNESS TO DB MIRRORING]

This option configures a witness on a mirrored database and enables the automatic failover.

The witness instance must be already installed .

If a witness is already configured in the mirroring configuration, it will be overridden by the new configuration.

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[REMOVE WITNESS FROM DB MIRRORING]

This option removes the witness configuration on the select mirrored DB.

This will disable automatic failover but the mirroring will persist (DB still replicated)

EVS DB Mirror Setup			
	EÝS	[SQL] Mirroring Setup	
		[Setup DB Mirroring]	
		[Stop DB Mirroring]	
		[FailOver DB Mirroring]	
		Remove Witness from DB Mirroring]	
	Please cho	ose the mirror you want to remove the Witness from	
		Database : IpRemote	
		Berrove Witness	
		[Restore Mirrored DB]	
		313105	
		THELP	
		© EVS Broadcast Equipment - Version 4.4.2 - 18/10/07	

This option can be used in the following cases :

- > You know that your Witness will be removed from the network and you have no other Witness to configure
- You know that your Witness and your backup DB server will be restarted at the same time but you want to keep your DB (and virtual IP) available on your main DB Server.
- You dismantle the IP Director network at the end of an event and you don't know if the mirroring will be used in the next event (typically for rental servers). It is recommended to remove the witness configuration to avoid database unavailability if you start just one DB Server (without the other and the witness).

[RESTORE A MIRRORED DB]

A mirrored database cannot be restored as a normal database. The mirroring must be first removed to be able to restore the database.

This part of the tool execute several actions to restore a mirrored DB :

- > Stop mirroring off the configured database
- > Take the first full database backup located in the configured backup file and restore it
- > Check the DB recovery model and configure it to "Full"
- > Create a DB Full backup on the principal server
- > Create a transaction log backup on the principal server
- > Restore the Full backup on the mirror server (with norecovery)
- > Restore the Transaction Log backup on the mirror server (with norecovery)
- > Create mirroring endpoints on principal, mirror and witness servers
- > Restart the mirroring process



This operation can take a few minutes.

HOW TO INSTALL OR CHANGE THE WITNESS INSTANCE ?

The Witness instance is important to activate the SQL automatic failover capabilities.

If you have two database servers without any witness or if you want to change the witness server for performance or availability reason, we provide you two ways to configure the witness (Assisted or Manual).

You should find an SQL 2005 Express on each IP-Director 5 or 6 This SQL Express is ready to host the witness role without other setup.

If no SQL 2005 is installed on the computer you want to use as witness, you can perform one of the following procedures

INSTALL SQL EXPRESS ON THE WITNESS WITH THE IP DIRECTOR FULL INSTALLER (HTA INSTALL)

This is the easiest way to have a SQL 2005 express, ready to be used as witness.

- > Retrieve the IP Director full installer from the IP Director release folder (HTA Install)
- > Launch the HTA Install and choose "New install install IP Director v6 on a new workstation"
- > The HTA will install all prerequisites and SQL 2005 express with the needed configuration
- > At the end of the installation, you can optionally uninstall the IP Director Remote Installer.
- > Your workstation is now ready to be used as witness.

MANUALLY INSTALL AND CONFIGURE WITNESS INSTANCE

INSTALL SQL SERVER 2005 EXPRESS EDITION ON THE NEW WITNESS

First of all you have to ensure that your future Witness server runs SQL 2005.

If this version of SQL Server is not present on the computer, you can install it by launching SQLEXPR_ADV.EXE

This package can be downloaded from the Microsoft Website (http://msdn.microsoft.com/vstudio/express/sgl/download/)

The witness instance can also easily be installed by launching the following batch file :

"Install_Witness_SQL2005_Express_With_SP2.bat". This batch file starts a silent installation with all the needed configuration

CREATE THE DATABASE ON THE WITNESS

After the Witness installation, we must create a database on the witness instance with the mirrored database name.

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The following screen shots will describe you the different steps to execute :

> - Launch The "Microsoft SQL Server Management Studio" and connect to an new database engine



> - The "Connect" box appears. Click on the Server Name list and choose "Browse for more"

🛃 Connect to Serve	r 🔀	Connect to Server	7	×
SQL Ser	Windows Server System	SQL Serv	ver.2005	Niccosoft: Windows Server System
Server type:	Database Engine	Server type:	Database Engine	_
Server name:	db59810	Server name:	0559910	•
Authentication:	Windows Authentication	Authentication:	db59810 db60110	
User name:	DB59810\DVB	User name:	db60100 db1	
Password:		Password:	w-smi 1.1.2.181	
	Remember password		127.0.0.1 DG965WH-2K3-VL <browse for="" more=""></browse>	
Conn	ect Cancel Help Options >>	Conne	ect Cancel	Help Options >>

> - Click on the "Network Servers" tab and choose the name of you SQL2005 instance in the list.



Click OK, Choose "Windows Authentication" as you authentication method and click "Connect"

SQL Serve	Windows Server System		
Server type:	Database Engine 💌		
Server name:	IPDIRECTOR51170		
Authentication: Windows Authentication			
User name: DB59810\DVB			
Password:			
	Remember password		
Connect	Cancel Help Options >>		

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When the Management studio is connect, right-click on "Databases" and create a new database

The osore see server management stadio	
Eile Edit <u>View P</u> roject <u>T</u> ools <u>W</u> indow <u>C</u> ommunity <u>H</u> elp	
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Object Explorer - 7 ×	Object Explorer Details 🔹 🗸
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🖃 🐻 db59810 (SQL Server 9.0.3042 - DB59810\DVB)	
	🚺 Databases
🗄 🧰 System Databases	
Database Snapshots In Remote	IPDIRECTOR51120\MIRROR\Databases 5 Item(s)
T Media	
IpRemote_RG2007	Name
🕀 🧰 Security	System Databases
Server Objects	CleanEditDB
Replication	间 IpRemote
🗄 🔝 Management	IpRemoteWC
Sol Server Agent	📔 mike
D SQL Server Agent D SQL Server 9.0.2047 - DB59810(D)	
T Databases	
Securit <u>N</u> ew Database	
Erver Even Attach	
Manage <u>R</u> estore Database	
Restore Files and Filegroups	
Reports +	
Refresh	
Ready	1

In the "New Database" screen, type your database name and click OK

🚪 New Database						
Select a page	<u> S</u> Script 👻 🚺 H	elp				
General						
Filegroups	Database <u>n</u> ame:		IpRemote			
	0wner:		<default></default>			
	L the full text in					
		ruexing				
	Database files:					
	Logical Name	File Type	Filegroup	Initial Size (MB)	Autogrowth	
	IpRemote	Data	PRIMARY	3	By 1 MB, unrestricted growth	
	IpRemote_log	Log	Not Applicable	1	By 10 percent, unrestricted growth	
Connection						
Connection						
IPDIRECTOR51120\mirror						
Connection:						
DB59810\DVB						
View connection properties						
Progress						
Ready	Ⅰ				Þ	
Wears of the second sec					Add Remove	
					OK Cancel	



CONFIGURE THE NEW WITNESS SERVER IN THE MIRRORING CONFIG

- > Open the "Microsoft SQL Server Management Studio" and connect to the server where the database is principal.
- > Right-Click on the database name and choose "Tasks" -> "Mirror..."



- The actual mirroring configuration will be displayed. If you want to change the Witness, click on "Configure Security"

🧊 Database Properties - IpRe	mote					
Select a page	🖾 Script 🝷 🚺 He	lp				
Files Filegroups Options	Ensure that security is configured for mirroring this database.					
Permissions	Server network ad	ddresses				
Mirroring	Principal:	TCP://DB60100:5022	Start Mirroring			
Ten sector Log shipping	<u>M</u> irror:	TCP://DB60110:5022	Pa <u>u</u> se			
	<u>W</u> itness:	TCP://IPDIRECTOR51160:5022	<u>R</u> emove Mirroring			
	Note: Use fully TCP://svr5.co	•qualified TCP addresses. For example: rp.abc.com:5022	Eailover			
	Operating mode					
	 High perfor the mirror. 	mance (asynchronous) Commit changes at the pr	rincipal and then transfer them to			
	 High safety principal ar 	v without automatic failover (synchronous) Always nd mirror.	commit changes at both the			
Connection	 High safety Commit cha automatic f 	with automatic failover (synchronous) Requires a anges at both the principal and mirror if both are ava ailover to the mirror if the principal becomes unavai	a witness server instance. ailable. The witness controls lable			
Server: db60100						
Connection: DB59810\DVB	S <u>t</u> atus:	Synchronized: the databases are fully synchronized	Refresh			
View connection properties						
Progress						
Ready						



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- A wizard will appear, click "Next" to show the first question. Choose "Yes" to configure the Witness Configure Database Mirroring Security Wizard

<u> </u>	· · · · · · · · · · · · · · · · · · ·	
•	Configure Database Mirroring Security Wizard	Include Witness Server Specify whether to include a witness server in the security configuration.
20	This wizard will help you configure the security settings for mirroring database TpFhemole". You can use this wizard to configure security settings on the following servers: - the principal server instance - the mirror server instance - the witness server instance (optional)	To operate database mirroring in synchronous mode with automatic failover, you must configure a witness server instance to monitor the status of the principal and mirror server instances and control the failover. Do you want to configure security to include a witness server instance?
	Do not show this starting page again.	
Help	< <u>B</u> ack Next > Einish >>1 Cancel	Help < <u>Back</u> Next> Einish>>1 Cancel

> - Verify that "Witness Server Instance" is checked

🖣 Configure Database Mirroring Security Wizard 📃 🗖	🖌 🎝 Configure Database Mirroring Security Wizard
Choose Servers to Configure Choose where to save the security configuration.	Principal Server Instance Specify information about the server instance where the database was originally located.
Save the security configuration on the following:	Principal server instance: db60100 Specify the properties of the endpoint through which the principal server instance will accept connections from the mirror and witness server instances: Listener port: Image: I
Help Kext> Einish>>> Cancel	

> Connect to the new Witness instance by clicking on "Connect" and choose the witness instance name.

Configure Database Mirroring Security Wizard Witness Server Instance Specify the server instance: Witness server instance: IPDIRECTORST120/mirror Security the properties of the endpoint through which the witness server instance will accept connections from the principal and mirror server instances: Ustener port: Image: Indepoint name: NOTE: If the principal, mirror or witness are instances on the same server, their endpoints must use different ports. NOTE: If the principal, mirror or witness are instances on the same server, their endpoints must use different ports.			enconnect to server		<u>^</u>	<u> </u>
Server Instances: Imported to the endpoint through which the witness server instance will accept connections from the principal and mirror server instances: Ustener port: Import Engrypt data sent through this endpoint. Endpoint name: Import Engrypt data sent through this endpoint. Endpoint name: Import Engrypt data sent through this endpoint. Endpoint name: Import Engrypt data sent through this endpoint. NOTE: If the principal, mirror or witness are instances on the same server, their endpoints must use different ports.	Configure Database Mirroring Security Wizard	Wi	SQL Serve	er.2005	Windows Server System	
Specify the properties of the endpoint through which the witness server instance will accept connections from the principal and mirror server instances: Listener port: Image: Connect Concel Endpoint name: Connect Concel NOTE: If the principal, mirror or witness are instances on the same server, their endpoints must use different ports. NOTE: If the principal, mirror or witness are instances on the same server, their endpoints must use different ports.	Vitness server instance: IPDIRECTOR51120\mirror	<u>Wi</u> t	Server <u>ty</u> pe: <u>S</u> ervername: Authentication:	Database Engine IPDIRECTOR51120 Windows Authentical	mirror	
Endpoint name: Endpoint name: DOTE: If the principal, mirror or witness are instances on the same server, their endpoints must use different ports. NOTE: If the principal, mirror or witness are instances on the same server, their endpoints must use different ports.	Specify the properties of the endpoint through which the witness server instance will accept connections from the principal and mirror server instances:	Spe cor		DB59810\DVB	sword	pt
NULE: If the principal, mirror or witness are instances on the same server, their endpoints must use different ports.	Engpoint name:		<u>C</u> onnect	Cancel	Help <u>O</u> ptions >>	
🔥 You must connect to this server instance using a login or account with the necessary 👘 🚺 The principal and witness server instances cannot be the same instance of SQL Serve	NOTE: II the principal, mirror or witness are instances on the same server, their endpoints must use different ports.		The principal and witness s	se different ports.	istances on the same serve	r, er.
permissions to save the security configuration before continuing this wizard. Help	permissions to save the security configuration before continuing this wizard.		Select another instance as	the witness server instan		

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> - Nothing should be configured in the "Service Account" screen. Click "Next" or "Finish" to apply the changes

📒 Configure Database Mirroring Security Wizard	_ 🗆 🗡	Configure Database Mirroring Security Wizard	
Service Accounts Specify the service accounts of the server instances.	2	Complete the Wizard Verify the choices made in the wizard and click. Finish.	B
If the server instances use different accounts in the same or trusted domain. accounts for SQL Server, enter the accounts below. Leave the textboxes en use the same account, the accounts are non-domain accounts, or the account intrusted domains. Service accounts for the following instances: <u>Principat</u> <u>Mirror:</u> <u>Mirror:</u> If the service accounts are different, the wizard will create logins for the account. If the service accounts are different, the endpoints for each account.	as their service npty if all instances unts are in	Click Finish to perform the following actions: On the principal server instance, db60100 • Modily the following properties of the minroring endpoint: • Name: endpoint_minroring • Listener Port: 5022 • Encryption: Yes • Role: Partner On the wintness server instance, IPDIRECTOR51120\minror • Modify the following properties of the minroring endpoint: • Name: Minroring • Listener Port: 5022 • Encryption: Yes • Modify the following properties of the minroring endpoint: • Name: Minroring • Listener Port: 5022 • Encryption: Yes • Role: Witness	
Help < Back Next > Einish >>I	Cancel	Help < Back Next > Finish	Cancel

> - Verify that the configuration has been completed successfully

Configure Database Mirroring Security W	'izard	
Configuring Endpoints Click Stop to interrupt the operation.		•
Success	2 Total 2 Success	0 Error 0 Warning
Details:		
Action	Status	Message
Configuring endpoint on principal server(Success	
Configuring endpoint on witness server(I	Success	
	Stop	<u>R</u> eport ▼
		Close

> - Click OK to validate your changes.

📒 Database Properties - IpRe	mote		_ 🗆 🗵		
Select a page	🔍 Script 👻 🚺 Help				
III General III Files III Filegroups III Options III Permissions	Ensure that security is o database.	configured for mirroring this	Configure Security		
Extended Properties	Server network addresses				
Transaction Log Shipping	Principal:	TCP://DB60100:5022	Start Mirroring		
	<u>M</u> irror:	TCP://DB60110:5022	Payse		
	Witness:	TCP://IPDIRECTOR51120:5022	Bemove Mirroring		
	Note: Use fully-qualified TCP addresses. For example: Eailover Eailover				
	Operating mode				
	 High performance (a the mirror. High safety without principal and mirror. 	asynchronous) Commit changes at th automatic failover (synchronous) Alv	e principal and then transfer them to vays commit changes at both the		
Connection	 High safety with aut Commit changes at automatic failover to 	omatic failover (synchronous) Requi both the principal and mirror if both are the mirror if the principal becomes un	es a witness server instance. • available. The witness controls available.		
Server: db60100					
Connection: DB59810\DVB	Status: Synchro synchro	nized: the databases are fully nized	Rgfresh		
View connection properties					
Progress					
C Ready					
			OK Cancel		

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