DATABASE MIRRORING

Database mirroring is a solution for increasing the availability of a SQL Server database. Mirroring is implemented on a per-database basis and works only with databases that use the full recovery model.

Benefits of Database Mirroring

Database mirroring is a simple strategy that offers the following benefits:

- Increases availability of a database.

  In the event of a disaster, in high-safety mode with automatic failover, failover quickly brings the standby copy of the database online (without data loss). In the other operating modes, the database administrator has the alternative of forcing service (with possible data loss) to the standby copy of the database. For more information, see Role Switching, later in this topic.

- Increases data protection.

  Database mirroring provides complete or almost complete redundancy of the data, depending on whether the operating mode is high-safety or high-performance. For more information, see Operating Modes, later in this topic.

  A database mirroring partner running on SQL Server 2008 Enterprise or later versions automatically tries to resolve certain types of errors that prevent reading a data page. The partner that is unable to read a page requests a fresh copy from the other partner. If this request succeeds, the unreadable page is replaced by the copy, which usually resolves the error. For more information, see Automatic Page Repair (Availability Groups: Database Mirroring).

- Improves the availability of the production database during upgrades.

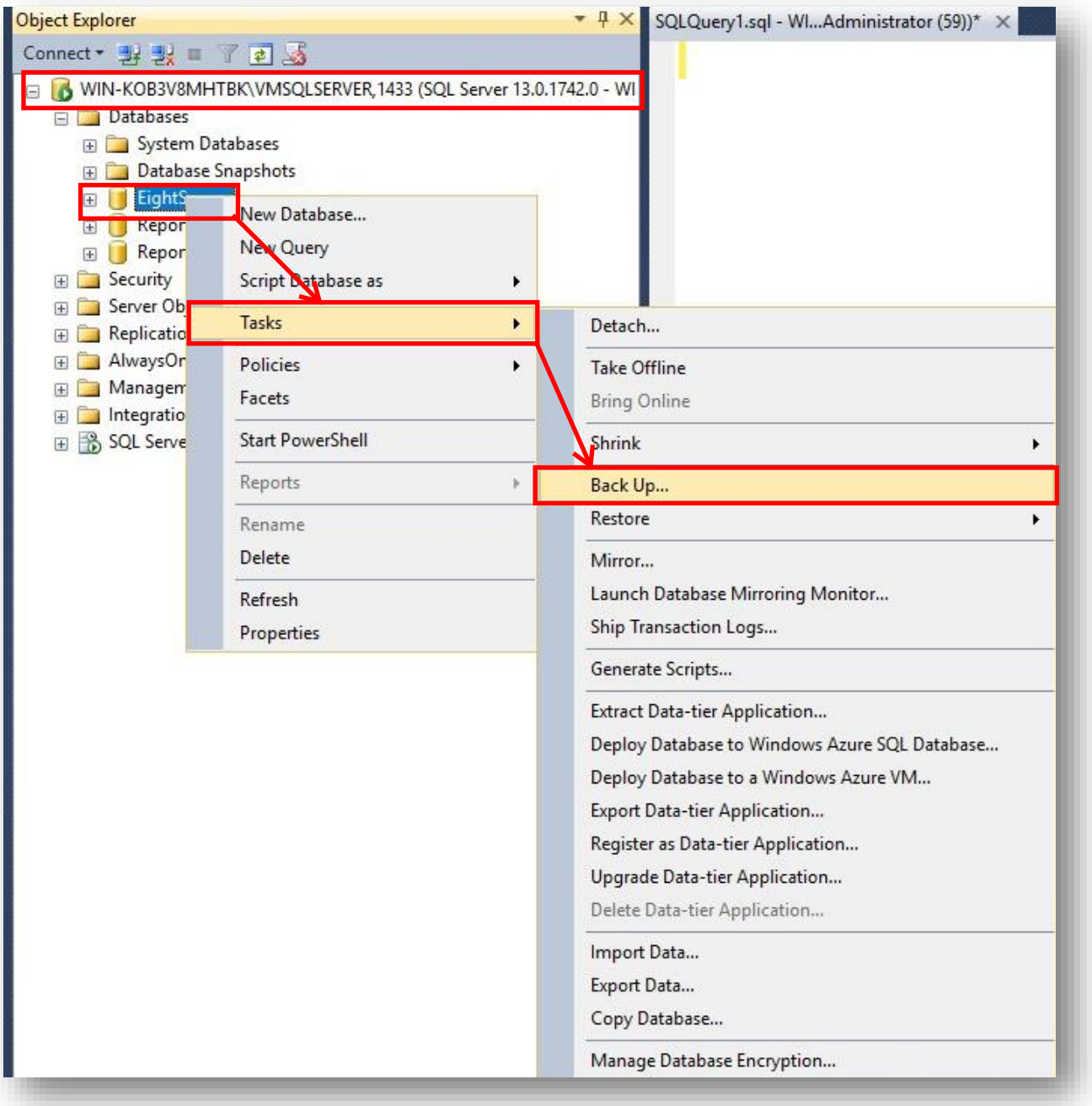
  To minimize downtime for a mirrored database, you can sequentially upgrade the instances of SQL Server that are hosting the failover partners. This will incur the downtime of only a single failover. This form of upgrade is known as a *rolling upgrade*. For more information, see Upgrading Mirrored Instances.

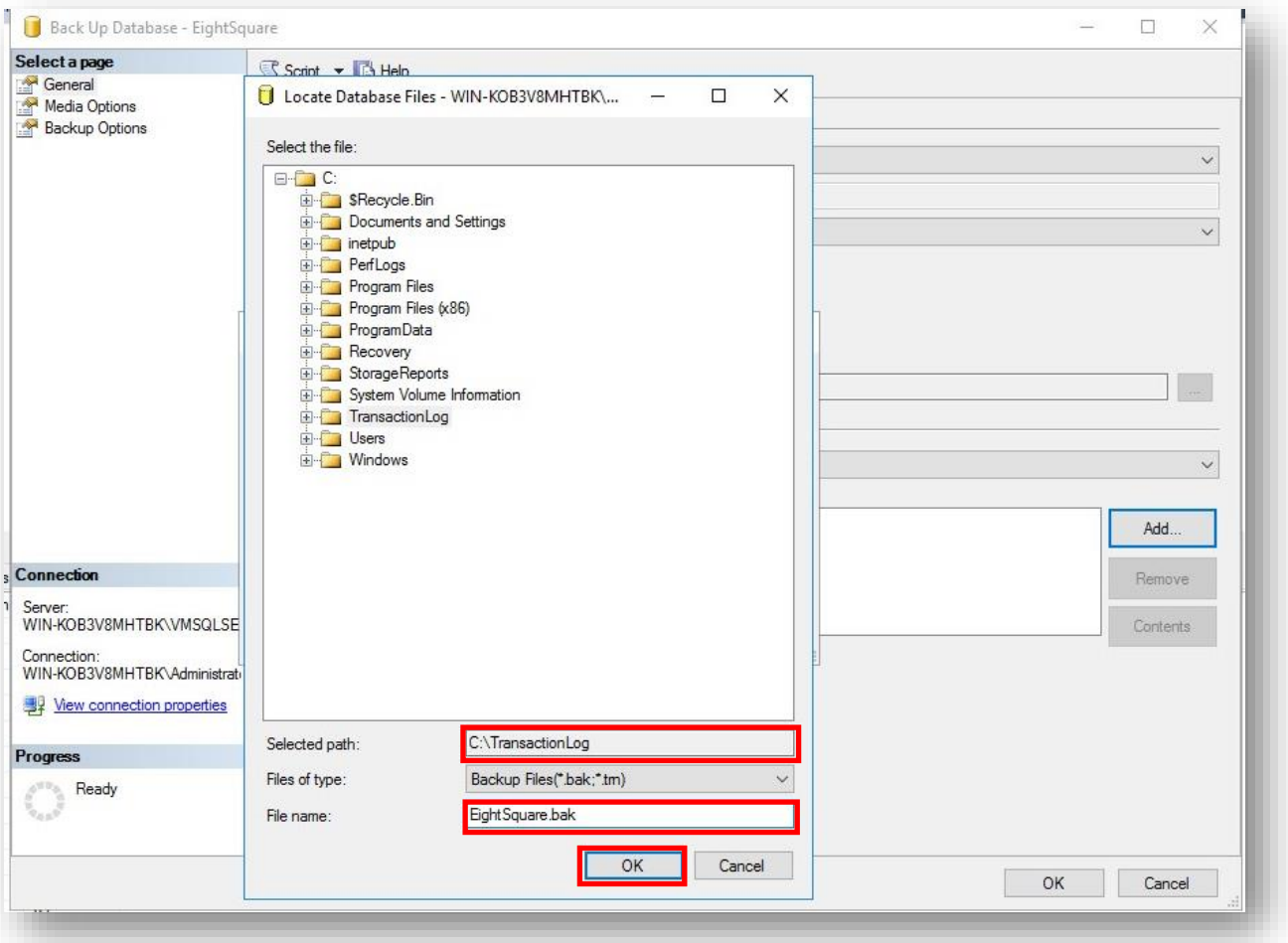
There are three steps of Database Mirroring.

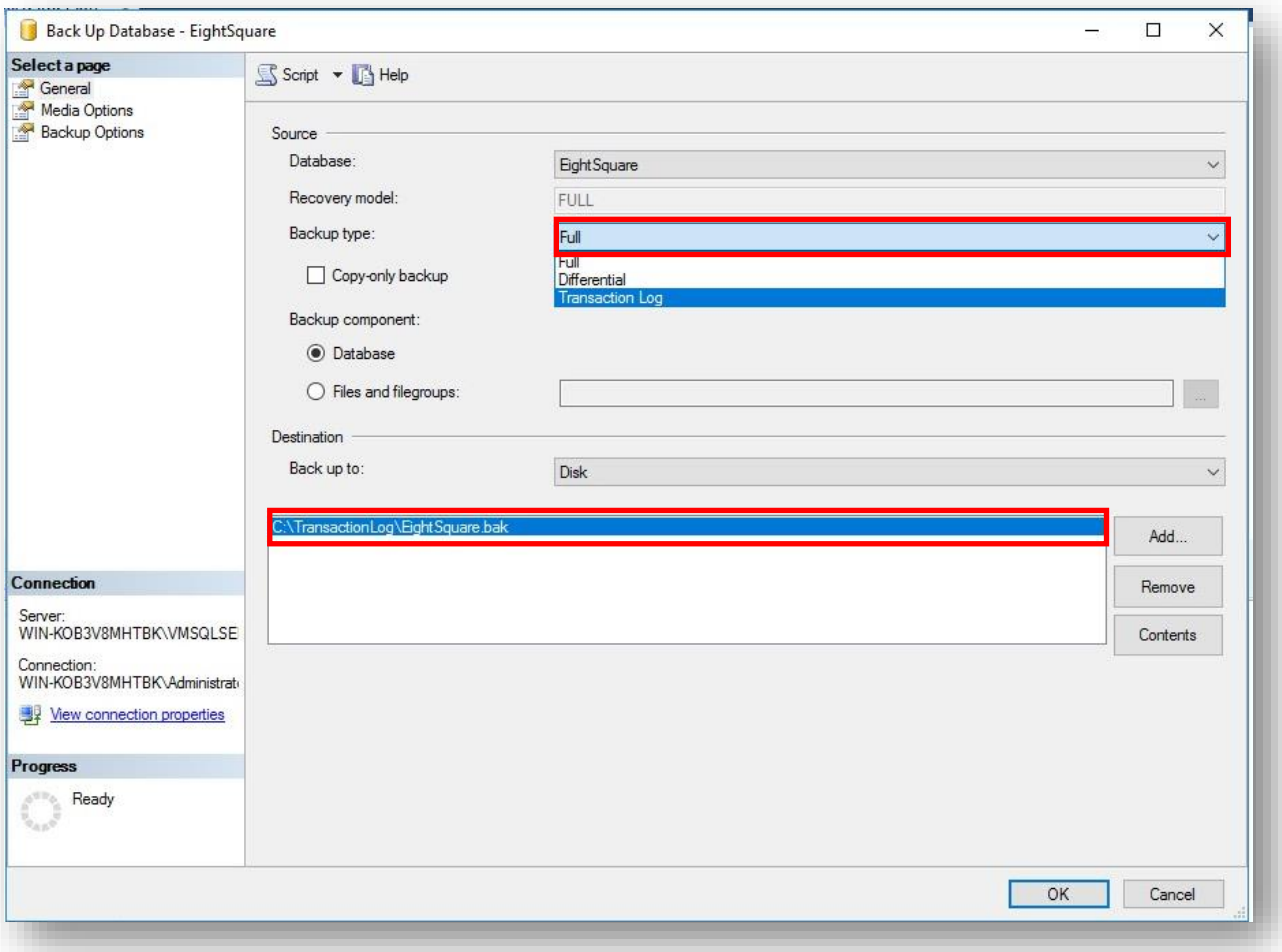
1. Full back up of Principle database and backup of Transactional logs.
2. Restore full backup and Transactional log backup on Mirroring server.
3. Configure Database Mirroring.

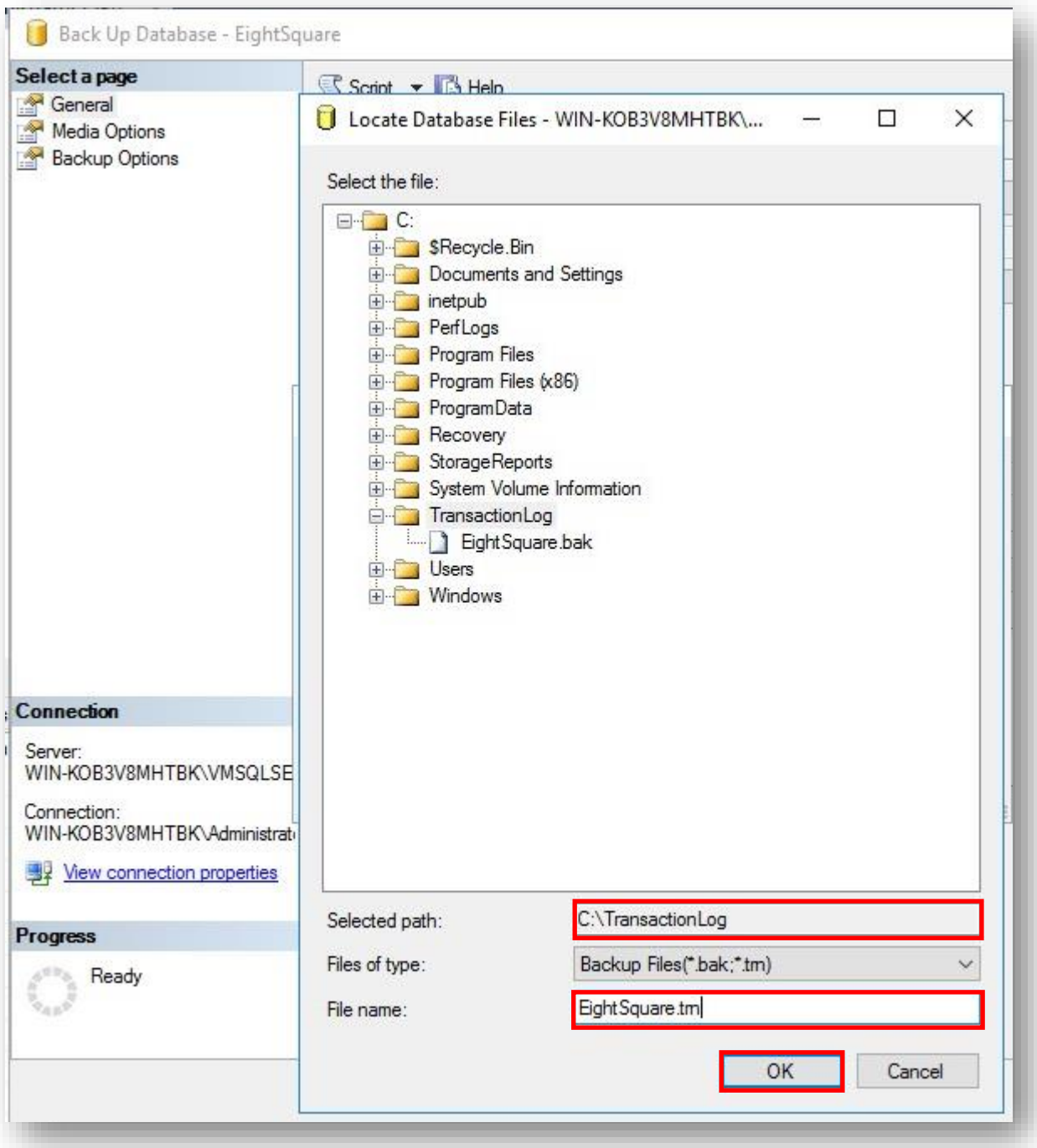
1.Full back up of Principle database and backup of Transactional logs.

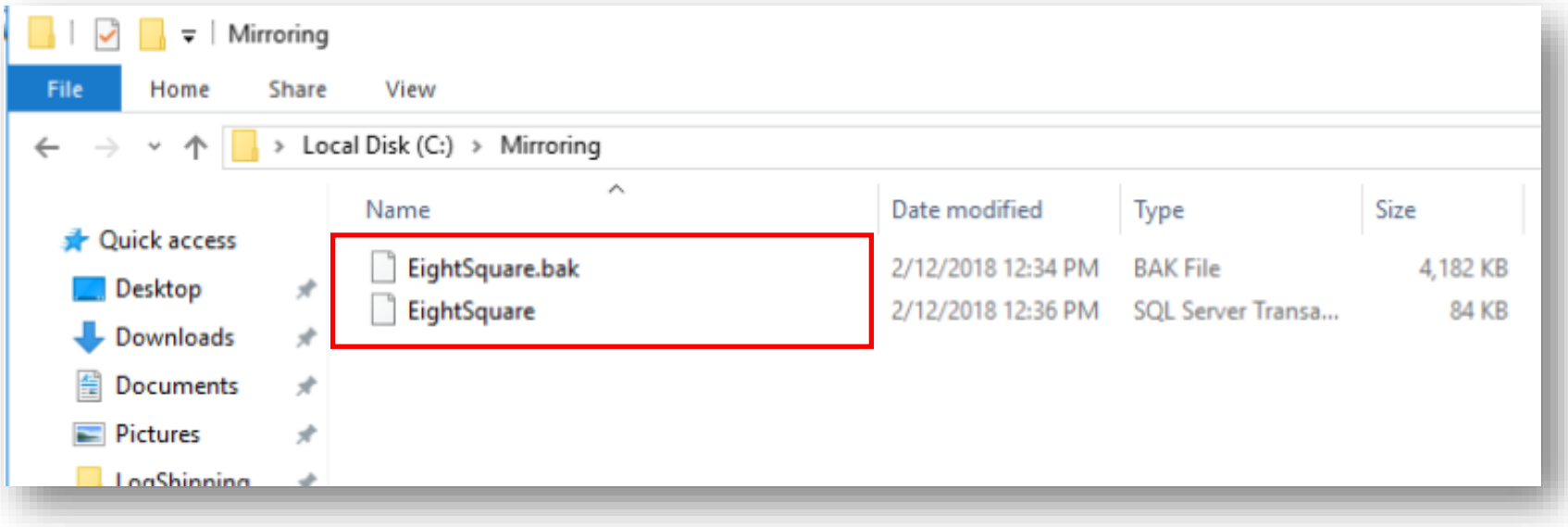
The very first step in database mirroring is to take full backup of principle database and also take Transactional log backup. For which right click on the Database on Principle server which we are planning to mirror the steps is shown in the screenshot below.





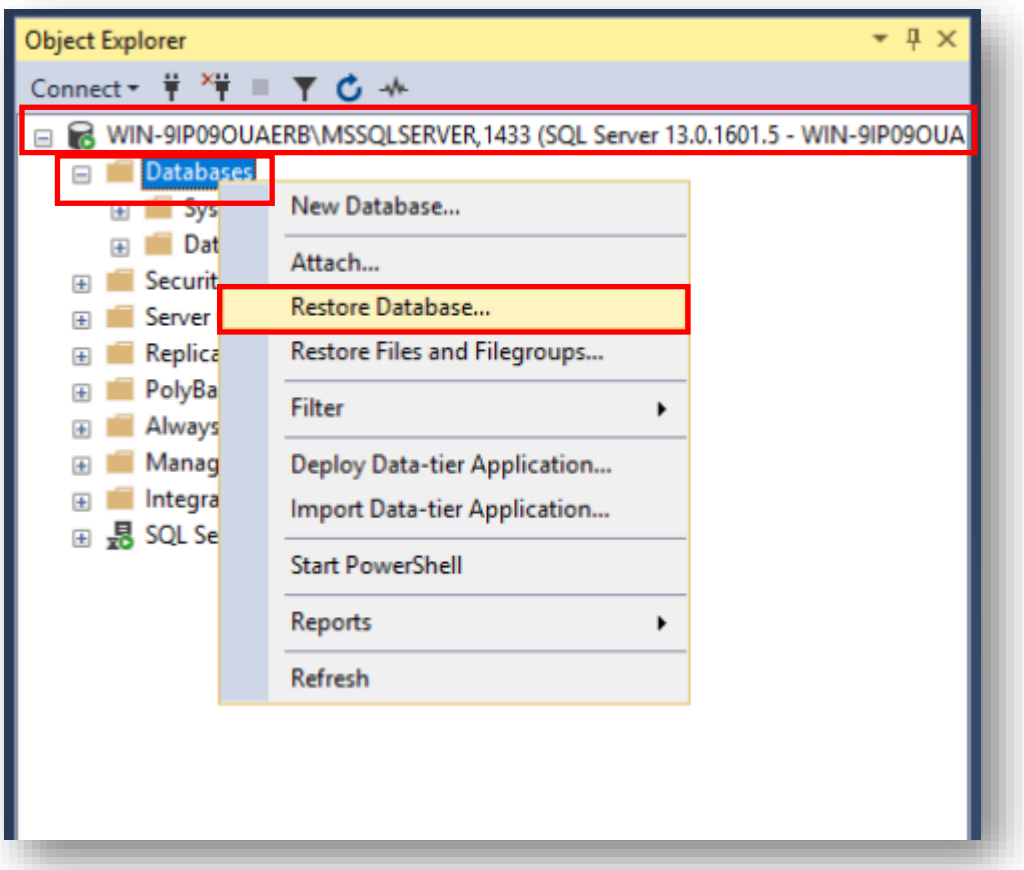

Back Up Database - EightSquare
Select a page
General
Media Options
Backup Options
Script
Help
Source
Database:
EightSquare
Recovery model:
FULL
Backup type:
Full
Full
Differential
Transaction Log
Copy-only backup
Backup component:
Database
Files and filegroups:
Destination
Back up to:
Disk
C:\TransactionLog\EightSquare.bak
Add...
Remove
Contents
Connection
Server:
WIN-KOB3V8MHTBK\VMSQLSE
Connection:
WIN-KOB3V8MHTBK\Administrat
View connection properties
Progress
Ready
OK
Cancel

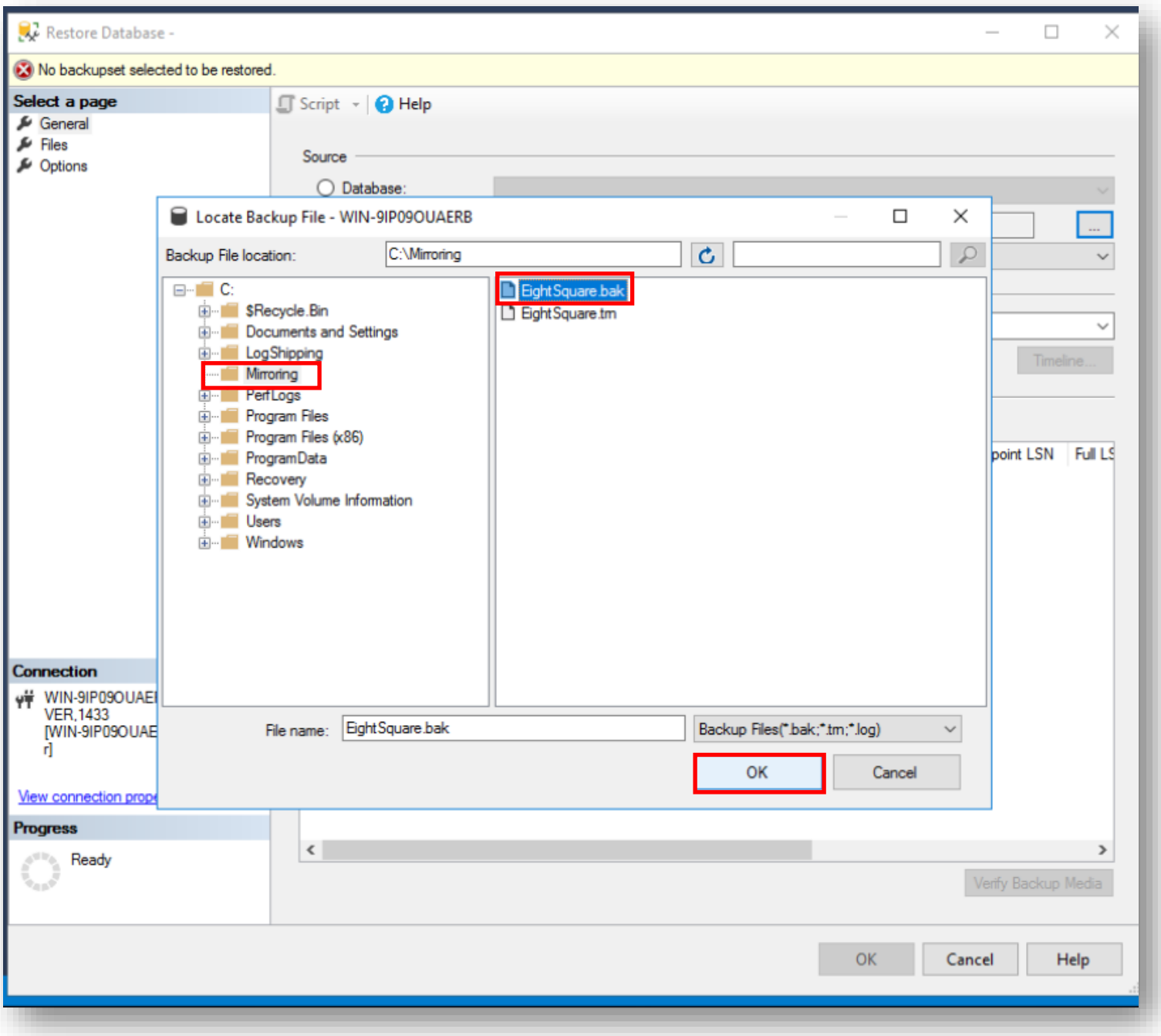

Back Up Database - EightSquare
Select a page
General
Media Options
Backup Options
Script
Help
Locate Database Files - WIN-KOB3V8MHTBK\...
Select the file:
C:
$Recycle.Bin
Documents and Settings
inetpub
PerfLogs
Program Files
Program Files (x86)
ProgramData
Recovery
StorageReports
System Volume Information
TransactionLog
EightSquare.bak
Users
Windows
Connection
Server:
WIN-KOB3V8MHTBK\VMSQLSE
Connection:
WIN-KOB3V8MHTBK\Administrat
View connection properties
Progress
Ready
Selected path:
C:\TransactionLog
Files of type:
Backup Files(*.bak;*.tm)
File name:
EightSquare.tm
OK
Cancel

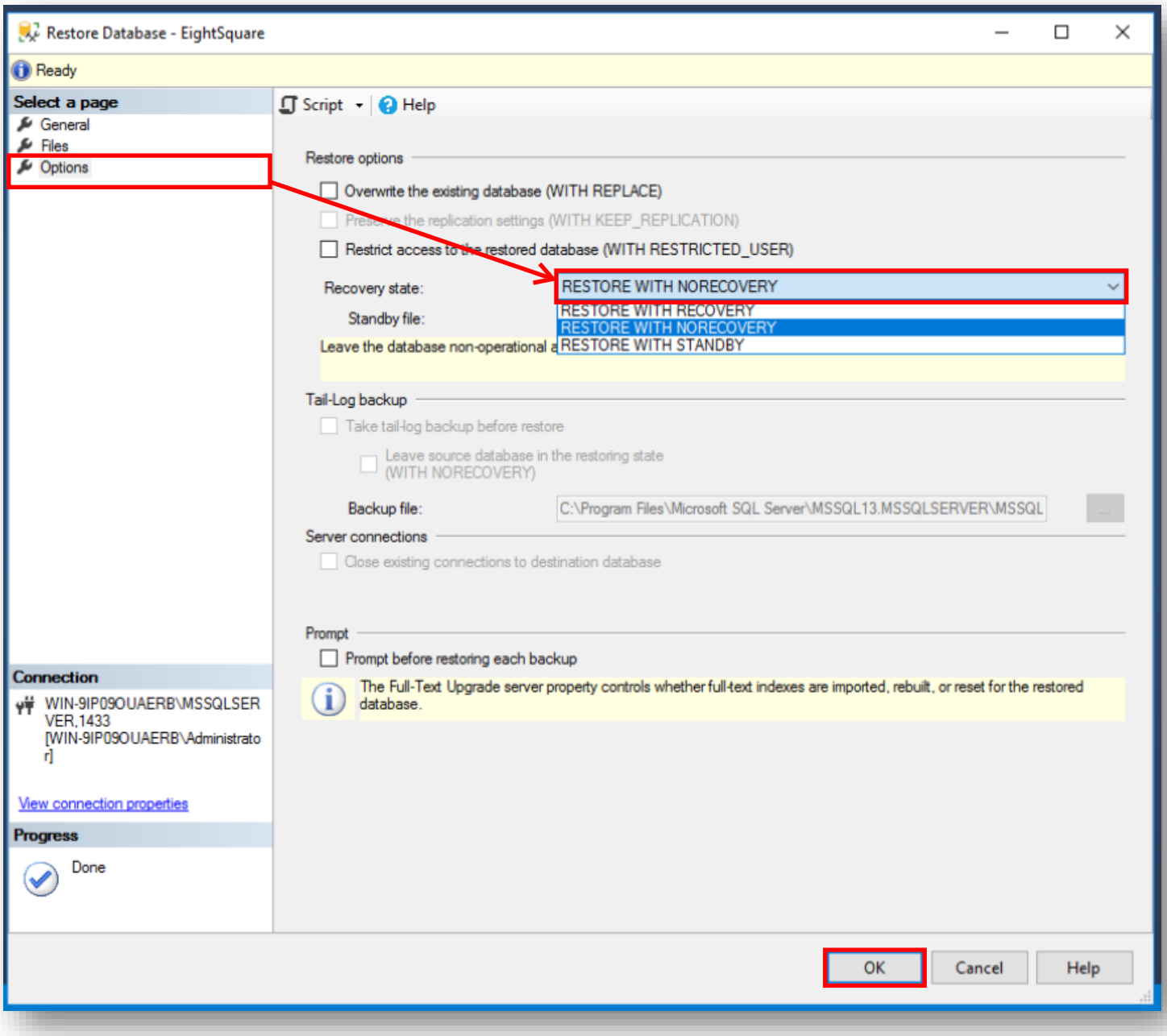

Mirroring
File
Home
Share
View
Local Disk (C:) › Mirroring
Quick access
Desktop
Downloads
Documents
Pictures
LogShipping
Name
Date modified
Type
Size
EightSquare.bak
2/12/2018 12:34 PM
BAK File
4,182 KB
EightSquare
2/12/2018 12:36 PM
SQL Server Transa...
84 KB

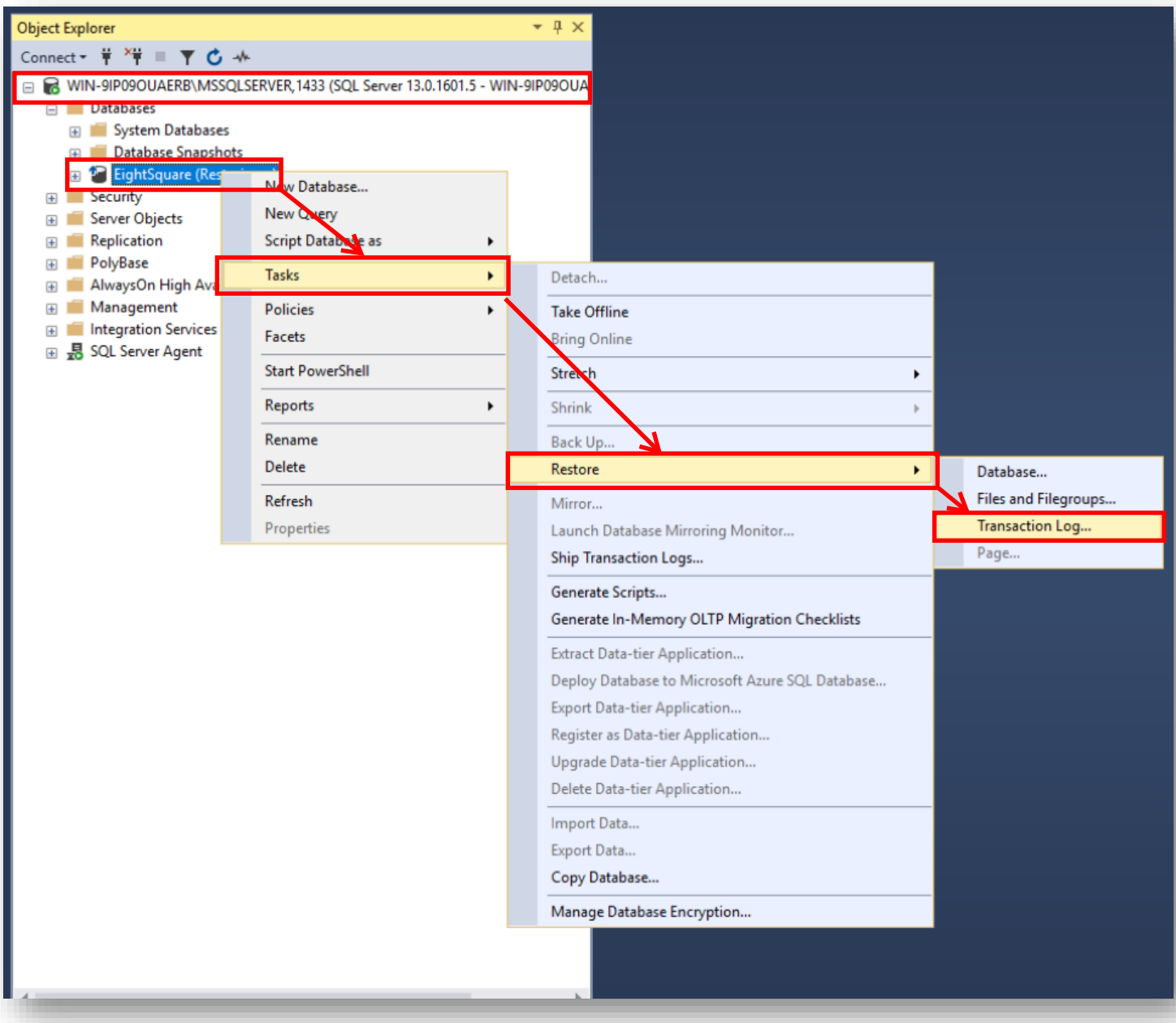
2. Restore Database on Mirroring Server

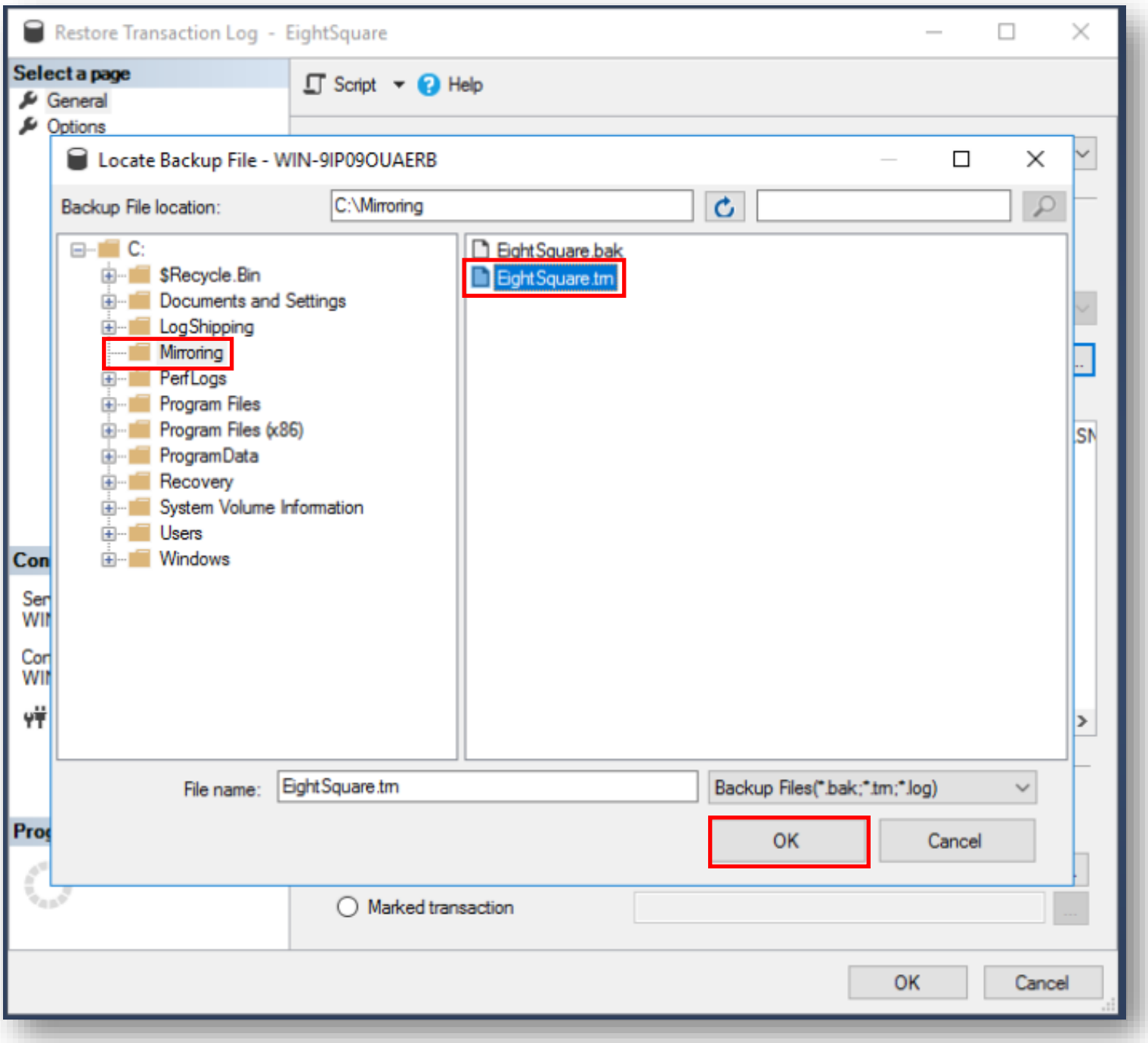
Restore the backup database on Mirroring server with **RESTORE WITH NORECOVERY** mode. The steps is shown in the screenshot below.

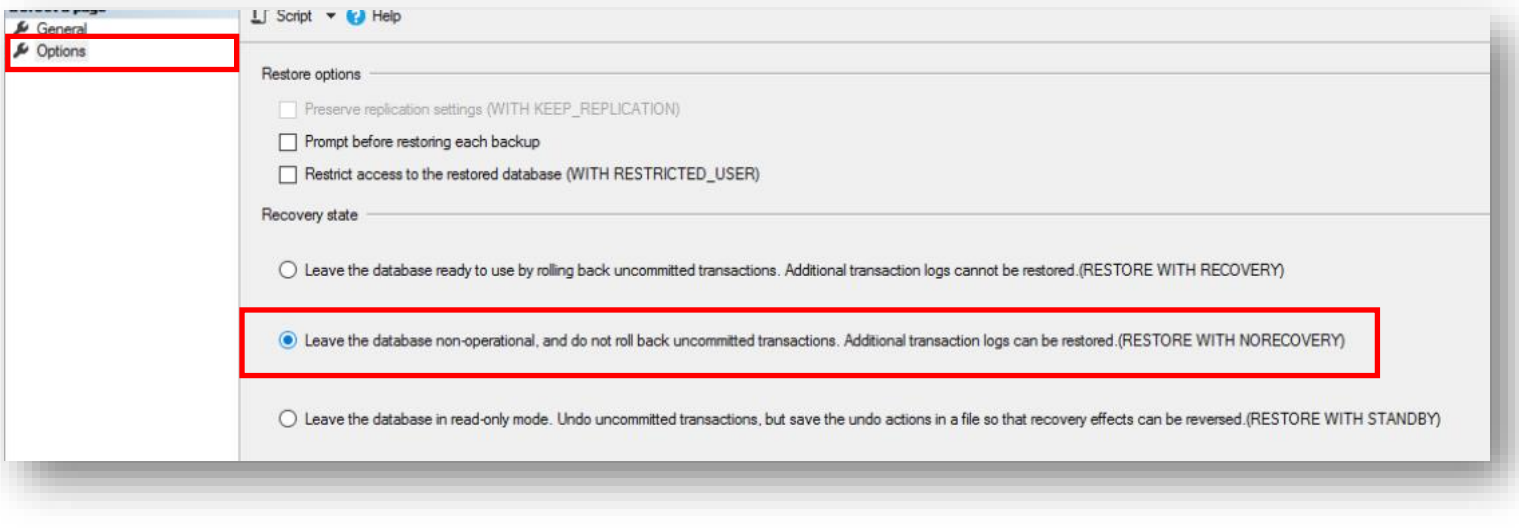





Restore Database - EightSquare
Ready
Select a page
General
Files
Options
Script
Help
Restore options
Overwrite the existing database (WITH REPLACE)
Preserve the replication settings (WITH KEEP_REPLICATION)
Restrict access to the restored database (WITH RESTRICTED_USER)
Recovery state:
RESTORE WITH NORECOVERY
Standby file:
RESTORE WITH RECOVERY
RESTORE WITH NORECOVERY
RESTORE WITH STANDBY
Leave the database non-operational a
Tail-Log backup
Take tail-log backup before restore
Leave source database in the restoring state (WITH NORECOVERY)
Backup file:
C:\Program Files\Microsoft SQL Server\MSSQL13.MSSQLSERVER\MSSQL
Server connections
Close existing connections to destination database
Prompt
Prompt before restoring each backup
The Full-Text Upgrade server property controls whether full-text indexes are imported, rebuilt, or reset for the restored database.
Connection
WIN-9IP09OUAERB\MSSQLSERVER,1433 [WIN-9IP09OUAERB\Administrator]
View connection properties
Progress
Done
OK
Cancel
Help

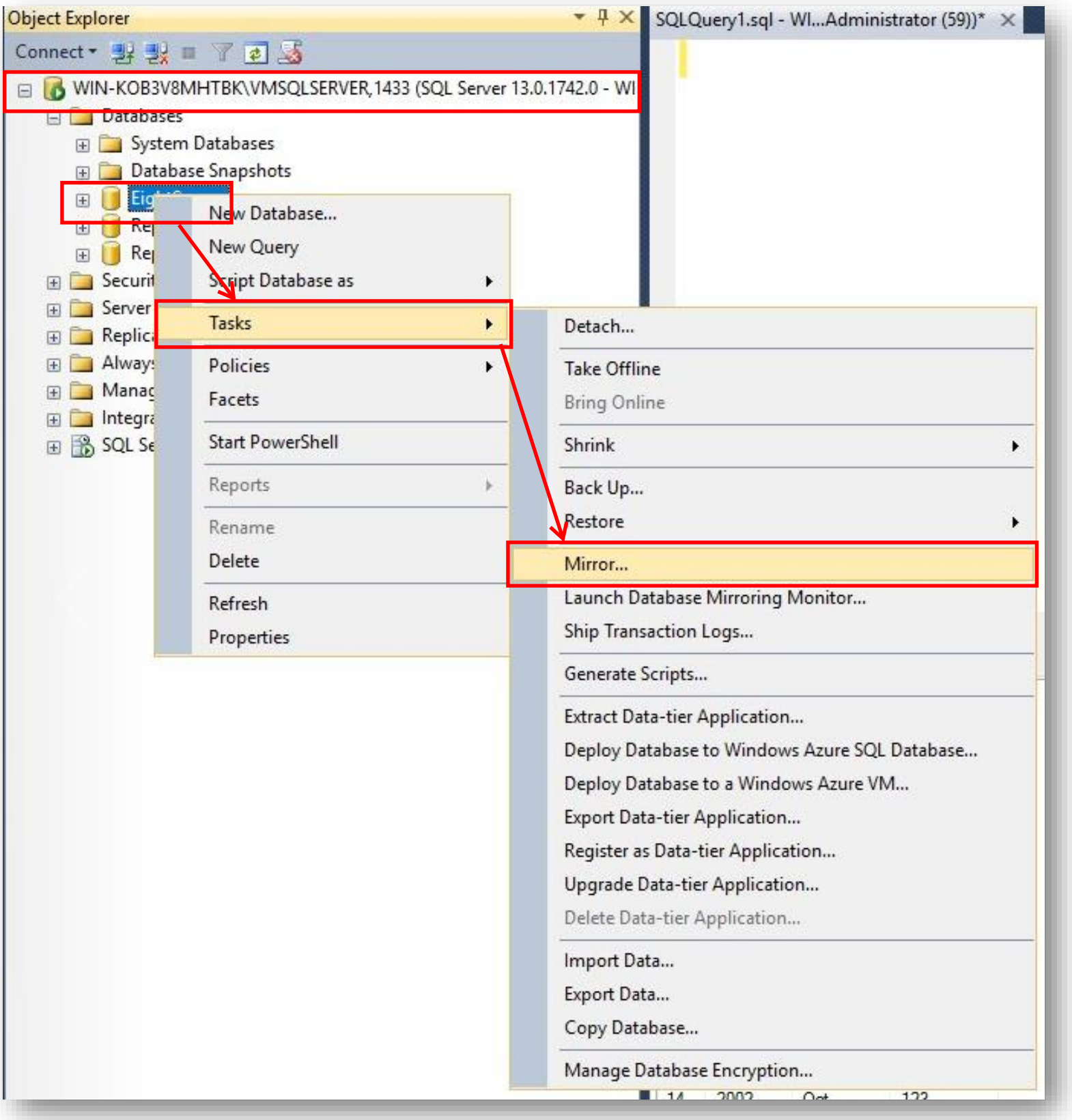

Object Explorer
Connect
WIN-9IP09OUAERB\MSSQLSERVER,1433 (SQL Server 13.0.1601.5 - WIN-9IP09OUA
Databases
System Databases
Database Snapshots
EightSquare (Res
Security
Server Objects
Replication
PolyBase
AlwaysOn High Ava
Management
Integration Services
SQL Server Agent
New Database...
New Query
Script Database as
Tasks
Policies
Facets
Start PowerShell
Reports
Rename
Delete
Refresh
Properties
Detach...
Take Offline
Bring Online
Stretch
Shrink
Back Up...
Restore
Mirror...
Launch Database Mirroring Monitor...
Ship Transaction Logs...
Generate Scripts...
Generate In-Memory OLTP Migration Checklists
Extract Data-tier Application...
Deploy Database to Microsoft Azure SQL Database...
Export Data-tier Application...
Register as Data-tier Application...
Upgrade Data-tier Application...
Delete Data-tier Application...
Import Data...
Export Data...
Copy Database...
Manage Database Encryption...
Database...
Files and Filegroups...
Transaction Log...
Page...

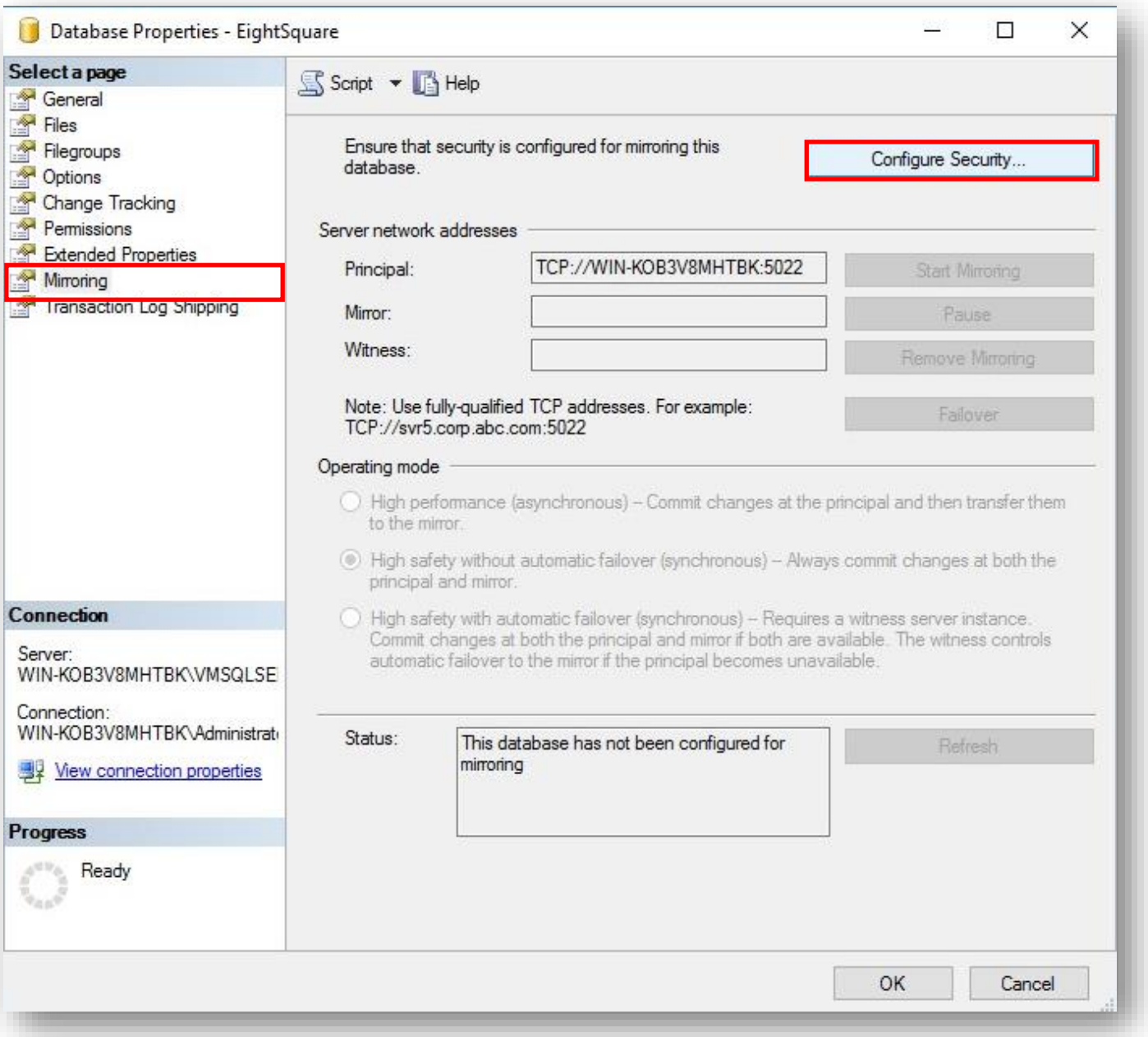

Restore Transaction Log - EightSquare
Select a page
General
Options
Script
Help
Locate Backup File - WIN-9IP09OUAERB
Backup File location:
C:\Mirroring
C:
$Recycle.Bin
Documents and Settings
LogShipping
Mirroring
PerfLogs
Program Files
Program Files (x86)
ProgramData
Recovery
System Volume Information
Users
Windows
EightSquare.bak
EightSquare.trn
File name:
EightSquare.trn
Backup Files(*.bak;*.trn;*.log)
OK
Cancel
Marked transaction
OK
Cancel

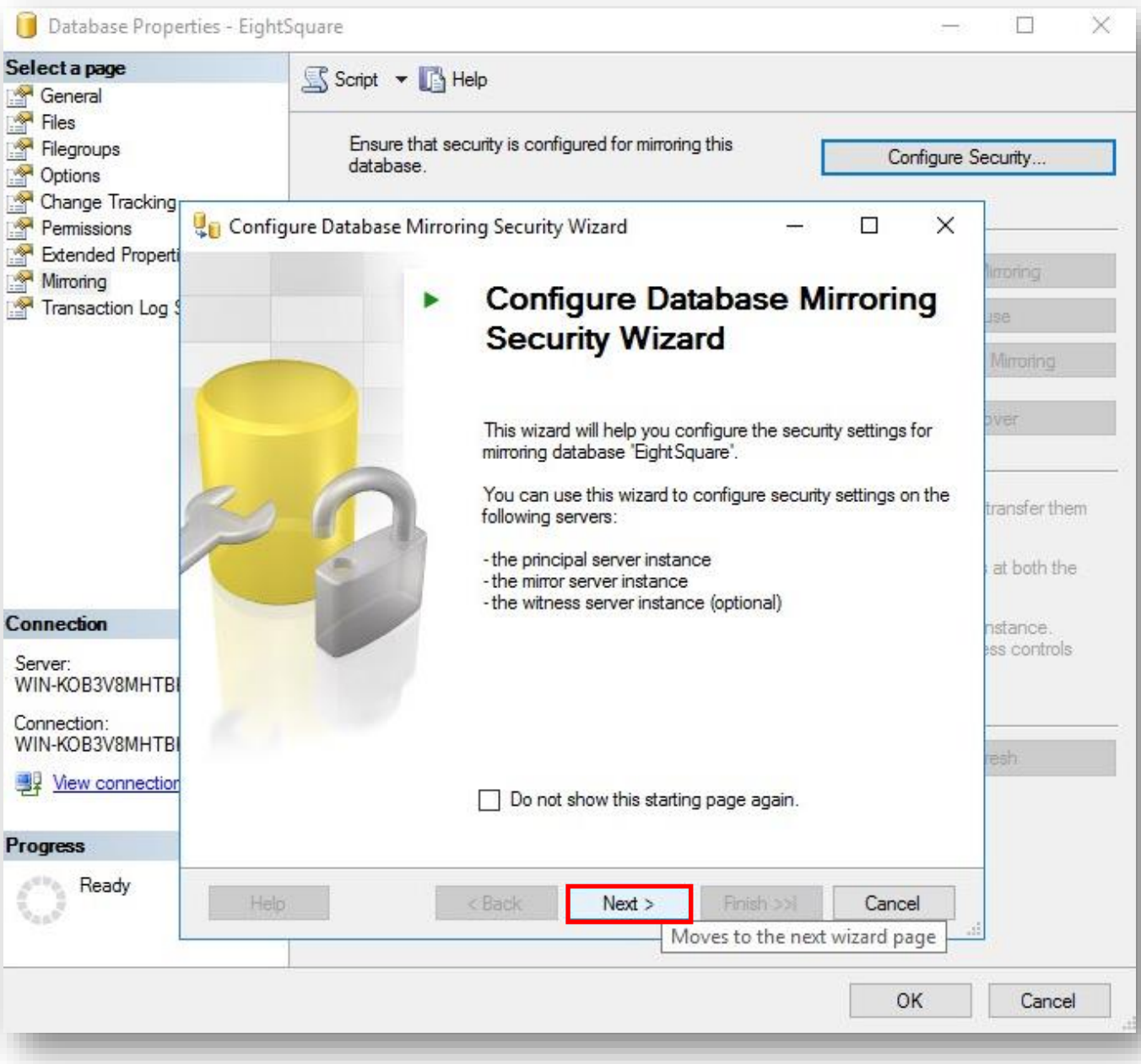

General
Options
Script
Help
Restore options
Preserve replication settings (WITH KEEP_REPLICATION)
Prompt before restoring each backup
Restrict access to the restored database (WITH RESTRICTED_USER)
Recovery state
Leave the database ready to use by rolling back uncommitted transactions. Additional transaction logs cannot be restored.(RESTORE WITH RECOVERY)
Leave the database non-operational, and do not roll back uncommitted transactions. Additional transaction logs can be restored.(RESTORE WITH NORECOVERY)
Leave the database in read-only mode. Undo uncommitted transactions, but save the undo actions in a file so that recovery effects can be reversed.(RESTORE WITH STANDBY)

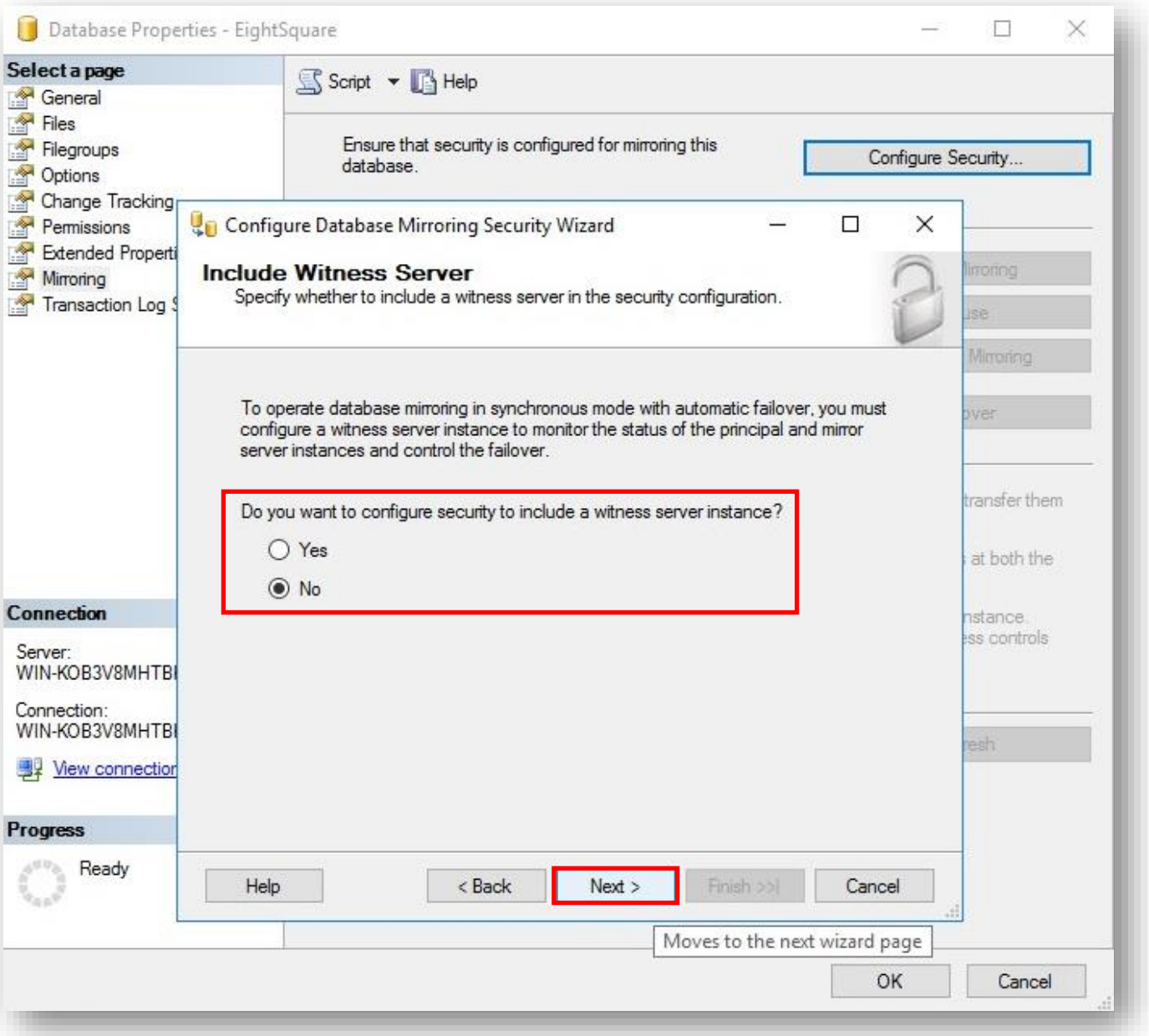
3. Configure Database Mirroring.

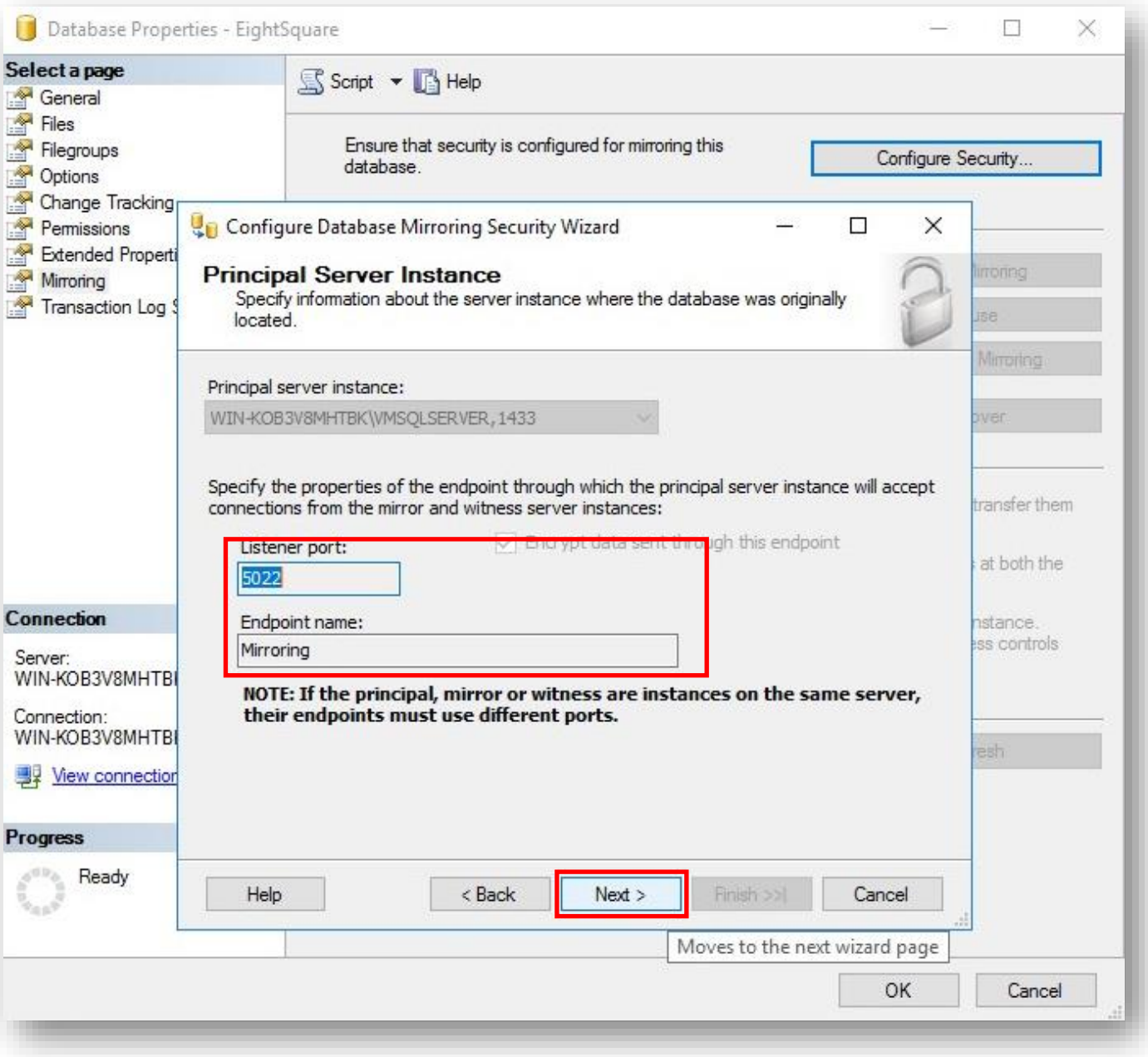
The steps to configure database mirroring is represented by the screenshot step by steps

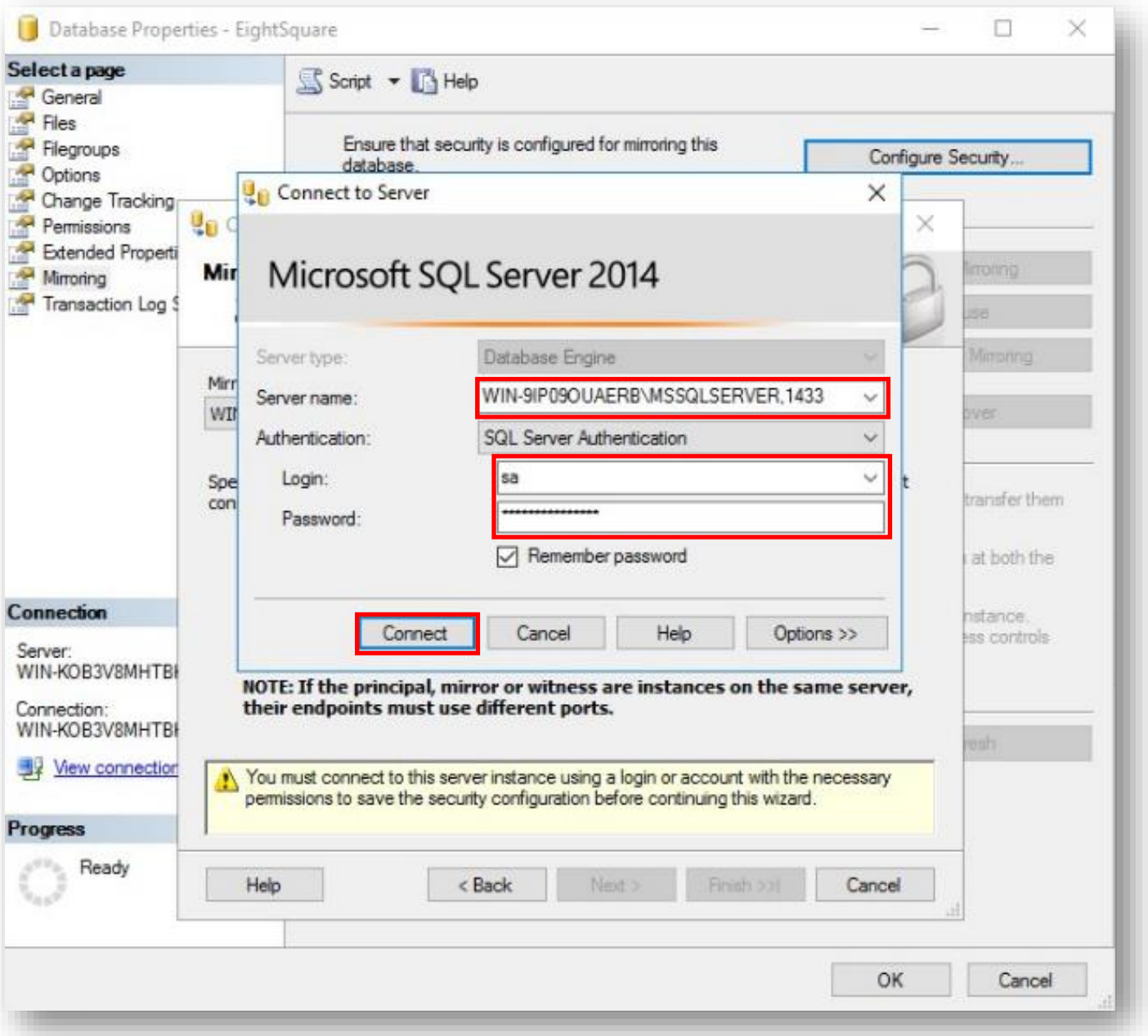


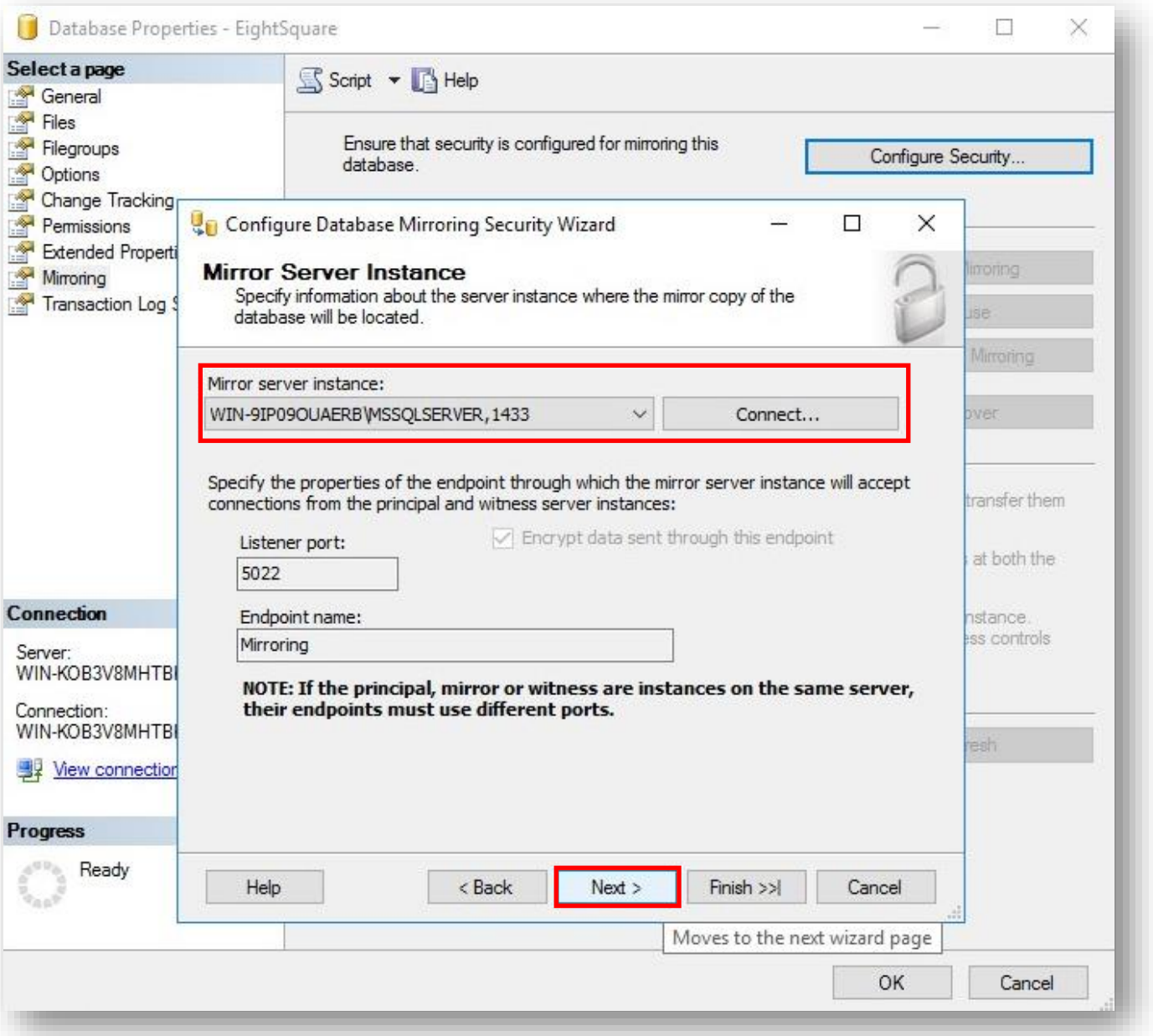

Database Properties - EightSquare
Select a page
General
Files
Filegroups
Options
Change Tracking
Permissions
Extended Properties
Mirroring
Transaction Log Shipping
Script
Help
Ensure that security is configured for mirroring this database.
Configure Security...
Server network addresses
Principal:
TCP://WIN-KOB3V8MHTBK:5022
Mirror:
Witness:
Start Mirroring
Pause
Remove Mirroring
Failover
Note: Use fully-qualified TCP addresses. For example: TCP://svr5.corp.abc.com:5022
Operating mode
High performance (asynchronous) – Commit changes at the principal and then transfer them to the mirror.
High safety without automatic failover (synchronous) – Always commit changes at both the principal and mirror.
High safety with automatic failover (synchronous) – Requires a witness server instance. Commit changes at both the principal and mirror if both are available. The witness controls automatic failover to the mirror if the principal becomes unavailable.
Status:
This database has not been configured for mirroring
Refresh
Connection
Server:
WIN-KOB3V8MHTBK\VMSQLSE
Connection:
WIN-KOB3V8MHTBK\Administrat
View connection properties
Progress
Ready
OK
Cancel

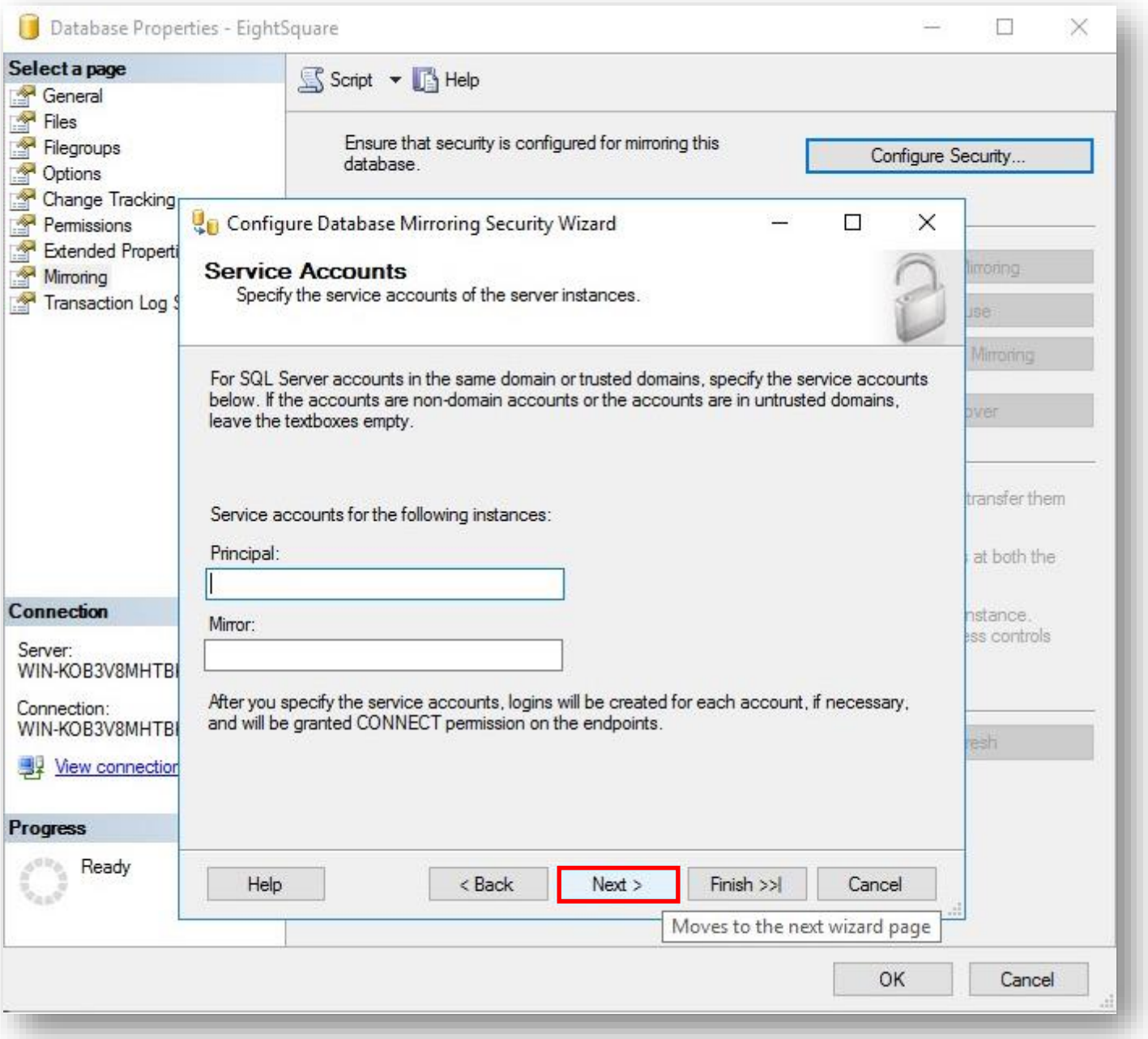

Database Properties - EightSquare
Configure Database Mirroring Security Wizard
Configure Database Mirroring Security Wizard
This wizard will help you configure the security settings for mirroring database 'EightSquare'.
You can use this wizard to configure security settings on the following servers:
- the principal server instance
- the mirror server instance
- the witness server instance (optional)
Do not show this starting page again.
Help
< Back
Next >
Finish >>|
Cancel
Moves to the next wizard page
OK
Cancel

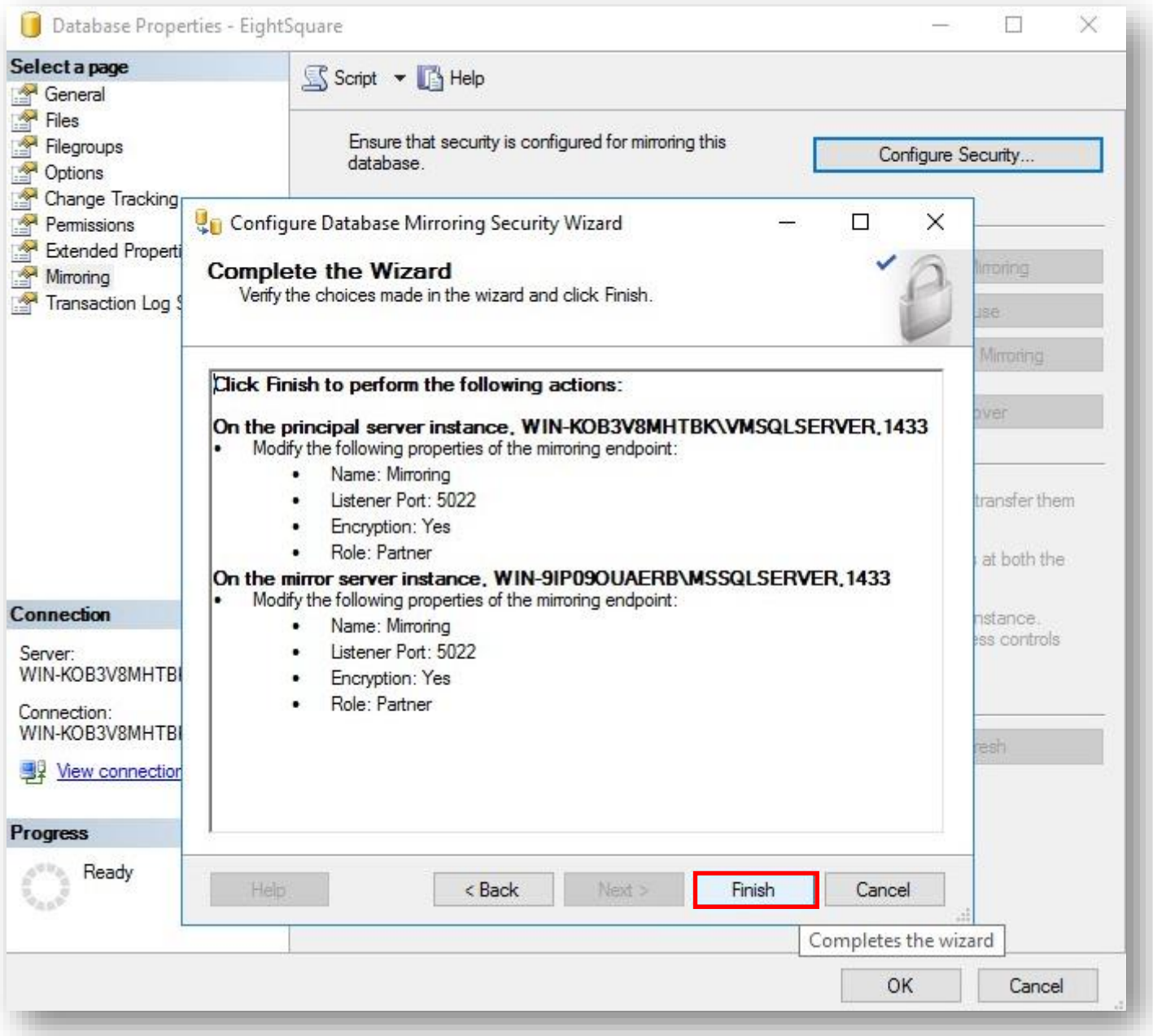

Database Properties - EightSquare
Select a page
General
Files
Filegroups
Options
Change Tracking
Permissions
Extended Properti
Mirroring
Transaction Log S
Script
Help
Ensure that security is configured for mirroring this database.
Configure Security...
Configure Database Mirroring Security Wizard
Include Witness Server
Specify whether to include a witness server in the security configuration.
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?
Yes
No
Connection
Server:
WIN-KOB3V8MHTBI
Connection:
WIN-KOB3V8MHTBI
View connection
Progress
Ready
Help
< Back
Next >
Finish >>|
Cancel
Moves to the next wizard page
OK
Cancel

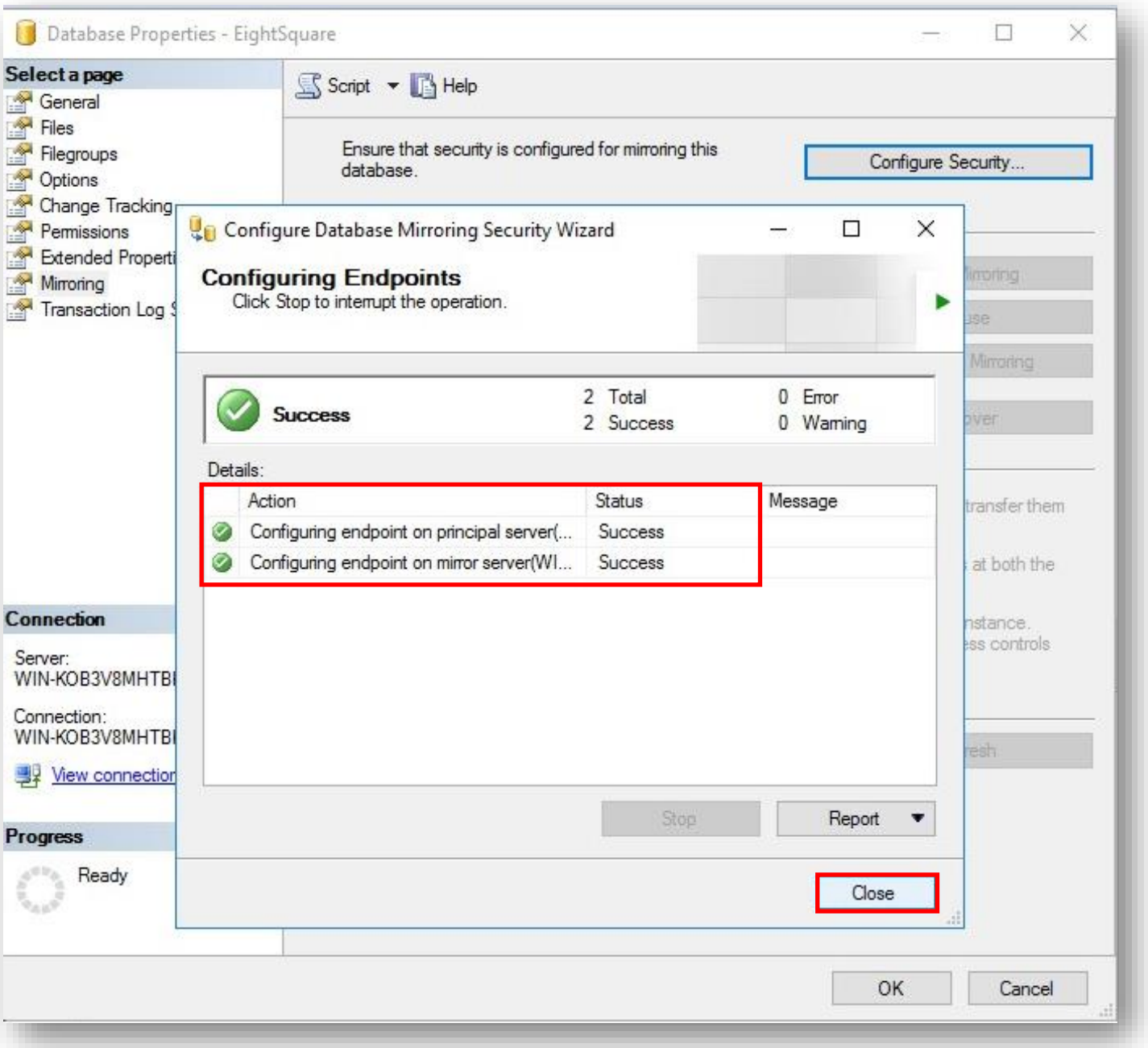

Database Properties - EightSquare
Select a page
General
Files
Filegroups
Options
Change Tracking
Permissions
Extended Properti
Mirroring
Transaction Log S
Script
Help
Ensure that security is configured for mirroring this database.
Configure Security...
Configure Database Mirroring Security Wizard
Principal Server Instance
Specify information about the server instance where the database was originally located.
Principal server instance:
WIN-KOB3V8MHTBK\VMSQLSERVER,1433
Specify the properties of the endpoint through which the principal server instance will accept connections from the mirror and witness server instances:
Listener port:
5022
Encrypt data sent through this endpoint
Endpoint name:
Mirroring
NOTE: If the principal, mirror or witness are instances on the same server, their endpoints must use different ports.
Connection
Server:
WIN-KOB3V8MHTBI
Connection:
WIN-KOB3V8MHTBI
View connection
Progress
Ready
Help
< Back
Next >
Finish >>|
Cancel
Moves to the next wizard page
OK
Cancel

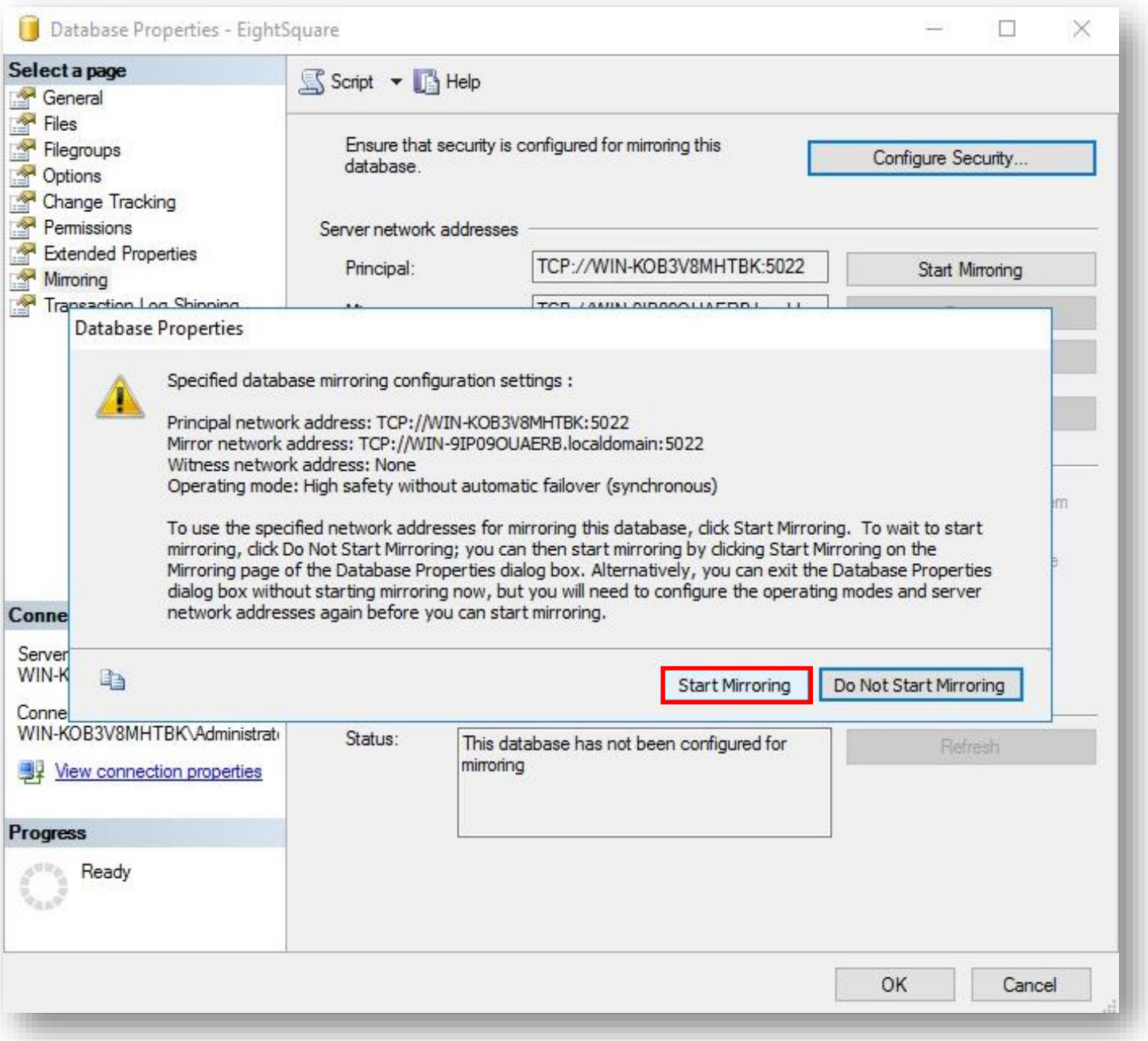

Database Properties - EightSquare
Select a page
General
Files
Filegroups
Options
Change Tracking
Permissions
Extended Properti
Mirroring
Transaction Log S
Script
Help
Ensure that security is configured for mirroring this database.
Configure Security...
Connect to Server
Microsoft SQL Server 2014
Server type:
Database Engine
Server name:
WIN-9IP09OUAERB\MSSQLSERVER,1433
Authentication:
SQL Server Authentication
Login:
sa
Password:
Remember password
Connect
Cancel
Help
Options >>
NOTE: If the principal, mirror or witness are instances on the same server, their endpoints must use different ports.
You must connect to this server instance using a login or account with the necessary permissions to save the security configuration before continuing this wizard.
Connection
Server:
WIN-KOB3V8MHTBI
Connection:
WIN-KOB3V8MHTBI
View connection
Progress
Ready
Help
< Back
Next >
Finish >>|
Cancel
OK
Cancel

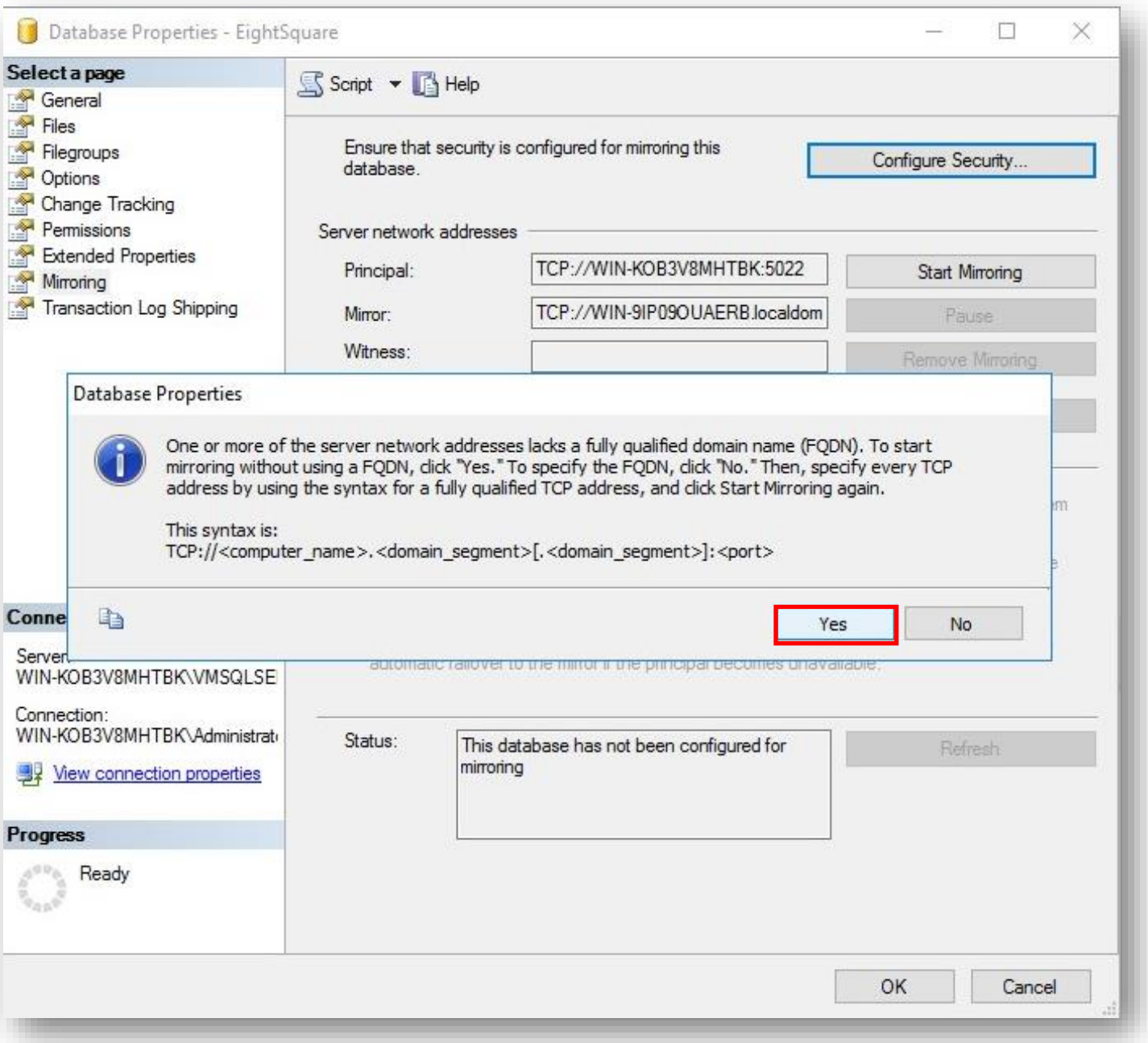

Database Properties - EightSquare
Select a page
General
Files
Filegroups
Options
Change Tracking
Permissions
Extended Properti
Mirroring
Transaction Log S
Script
Help
Ensure that security is configured for mirroring this database.
Configure Security...
Configure Database Mirroring Security Wizard
Mirror Server Instance
Specify information about the server instance where the mirror copy of the database will be located.
Mirror server instance:
WIN-9IP09OUAERB\MSSQLSERVER,1433
Connect...
Specify the properties of the endpoint through which the mirror server instance will accept connections from the principal and witness server instances:
Listener port:
5022
Encrypt data sent through this endpoint
Endpoint name:
Mirroring
NOTE: If the principal, mirror or witness are instances on the same server, their endpoints must use different ports.
Connection
Server:
WIN-KOB3V8MHTBI
Connection:
WIN-KOB3V8MHTBI
View connection
Progress
Ready
Help
< Back
Next >
Finish >>|
Cancel
Moves to the next wizard page
OK
Cancel

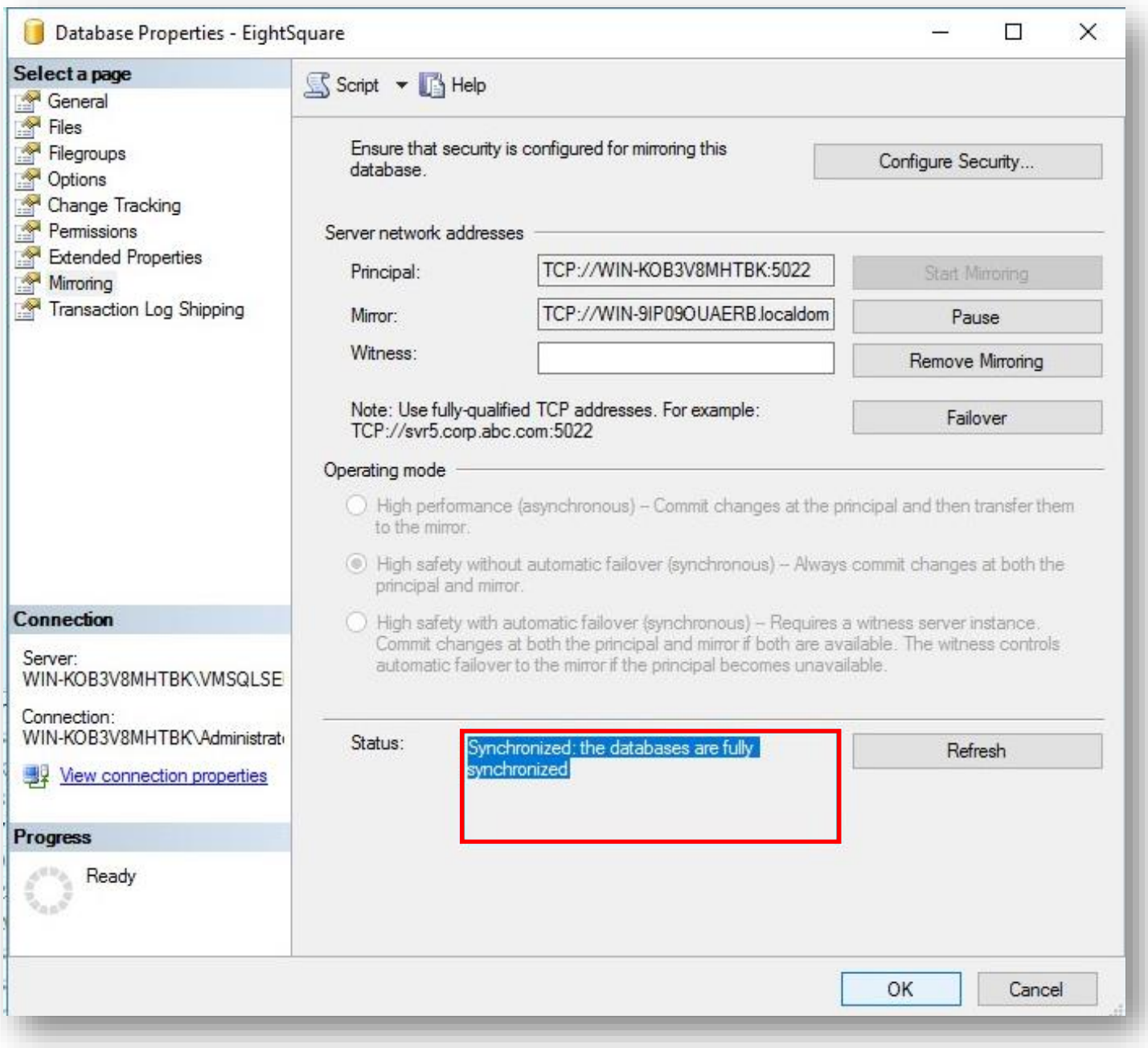

Database Properties - EightSquare
Select a page
General
Files
Filegroups
Options
Change Tracking
Permissions
Extended Properti
Mirroring
Transaction Log S
Script
Help
Ensure that security is configured for mirroring this database.
Configure Security...
Configure Database Mirroring Security Wizard
Service Accounts
Specify the service accounts of the server instances.
For SQL Server accounts in the same domain or trusted domains, specify the service accounts below. If the accounts are non-domain accounts or the accounts are in untrusted domains, leave the textboxes empty.
Service accounts for the following instances:
Principal:
Mirror:
After you specify the service accounts, logins will be created for each account, if necessary, and will be granted CONNECT permission on the endpoints.
Connection
Server:
WIN-KOB3V8MHTBI
Connection:
WIN-KOB3V8MHTBI
View connection
Progress
Ready
Help
< Back
Next >
Finish >>|
Cancel
Moves to the next wizard page
OK
Cancel

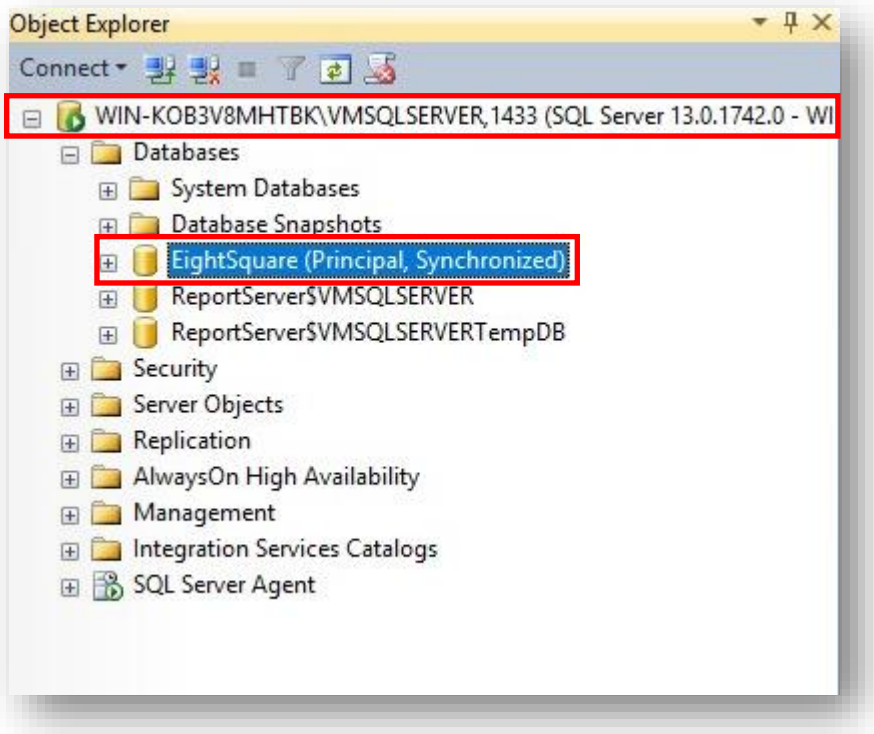

Database Properties - EightSquare
Select a page
General
Files
Filegroups
Options
Change Tracking
Permissions
Extended Properti
Mirroring
Transaction Log S
Script
Help
Ensure that security is configured for mirroring this database.
Configure Security...
Configure Database Mirroring Security Wizard
Complete the Wizard
Verify the choices made in the wizard and click Finish.
Click Finish to perform the following actions:
On the principal server instance, WIN-KOB3V8MHTBK\VMSQLSERVER,1433
Modify the following properties of the mirroring endpoint:
Name: Mirroring
Listener Port: 5022
Encryption: Yes
Role: Partner
On the mirror server instance, WIN-9IP09OUAERB\MSSQLSERVER,1433
Modify the following properties of the mirroring endpoint:
Name: Mirroring
Listener Port: 5022
Encryption: Yes
Role: Partner
Connection
Server:
WIN-KOB3V8MHTBI
Connection:
WIN-KOB3V8MHTBI
View connection
Progress
Ready
Help
< Back
Next >
Finish
Cancel
Completes the wizard
OK
Cancel


Database Properties - EightSquare
Select a page
General
Files
Filegroups
Options
Change Tracking
Permissions
Extended Properti
Mirroring
Transaction Log S
Script
Help
Ensure that security is configured for mirroring this database.
Configure Security...
Configure Database Mirroring Security Wizard
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 mirror server(WI...
Success
Stop
Report
Close
Connection
Server:
WIN-KOB3V8MHTBI
Connection:
WIN-KOB3V8MHTBI
View connection
Progress
Ready
OK
Cancel

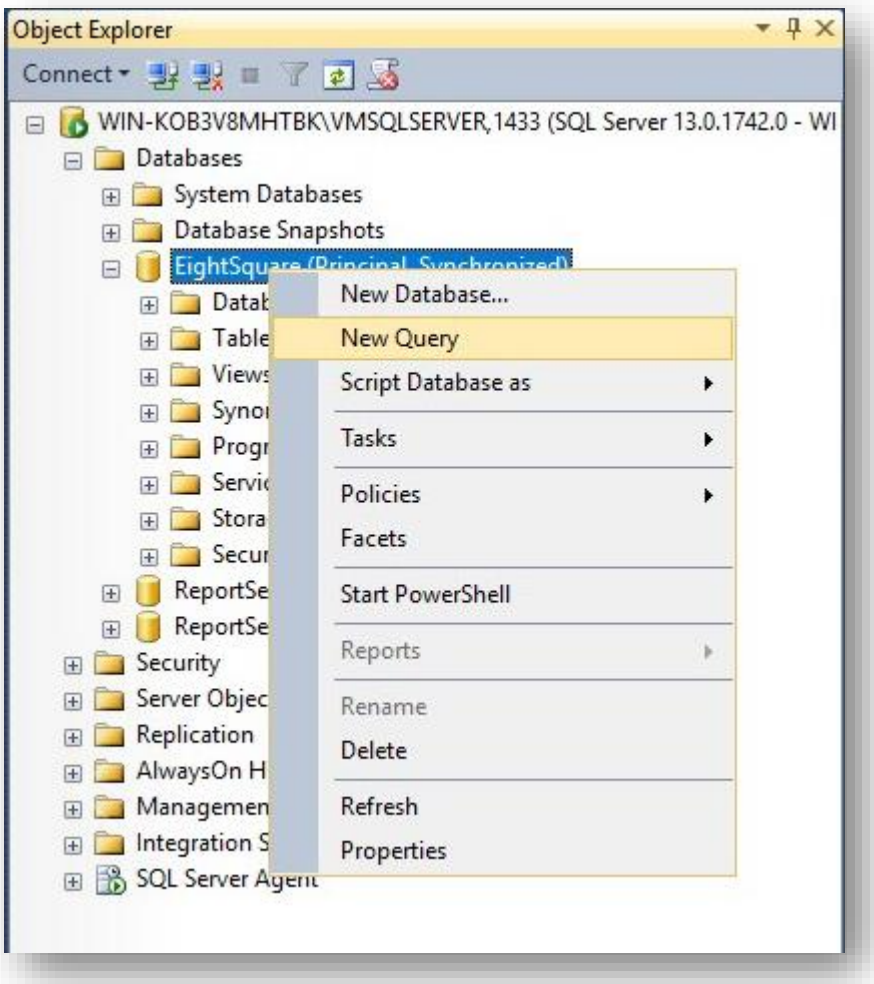

Database Properties - EightSquare
Select a page
General
Files
Filegroups
Options
Change Tracking
Permissions
Extended Properties
Mirroring
Transaction Log Shipping
Script
Help
Ensure that security is configured for mirroring this database.
Configure Security...
Server network addresses
Principal:
TCP://WIN-KOB3V8MHTBK:5022
Start Mirroring
Database Properties
Specified database mirroring configuration settings :
Principal network address: TCP://WIN-KOB3V8MHTBK:5022
Mirror network address: TCP://WIN-9IP09OUAERB.localdomain:5022
Witness network address: None
Operating mode: High safety without automatic failover (synchronous)
To use the specified network addresses for mirroring this database, click Start Mirroring. To wait to start mirroring, click Do Not Start Mirroring; you can then start mirroring by clicking Start Mirroring on the Mirroring page of the Database Properties dialog box. Alternatively, you can exit the Database Properties dialog box without starting mirroring now, but you will need to configure the operating modes and server network addresses again before you can start mirroring.
Start Mirroring
Do Not Start Mirroring
Conne
Server
WIN-K
Conne
WIN-KOB3V8MHTBK\Administrat
View connection properties
Status:
This database has not been configured for mirroring
Refresh
Progress
Ready
OK
Cancel

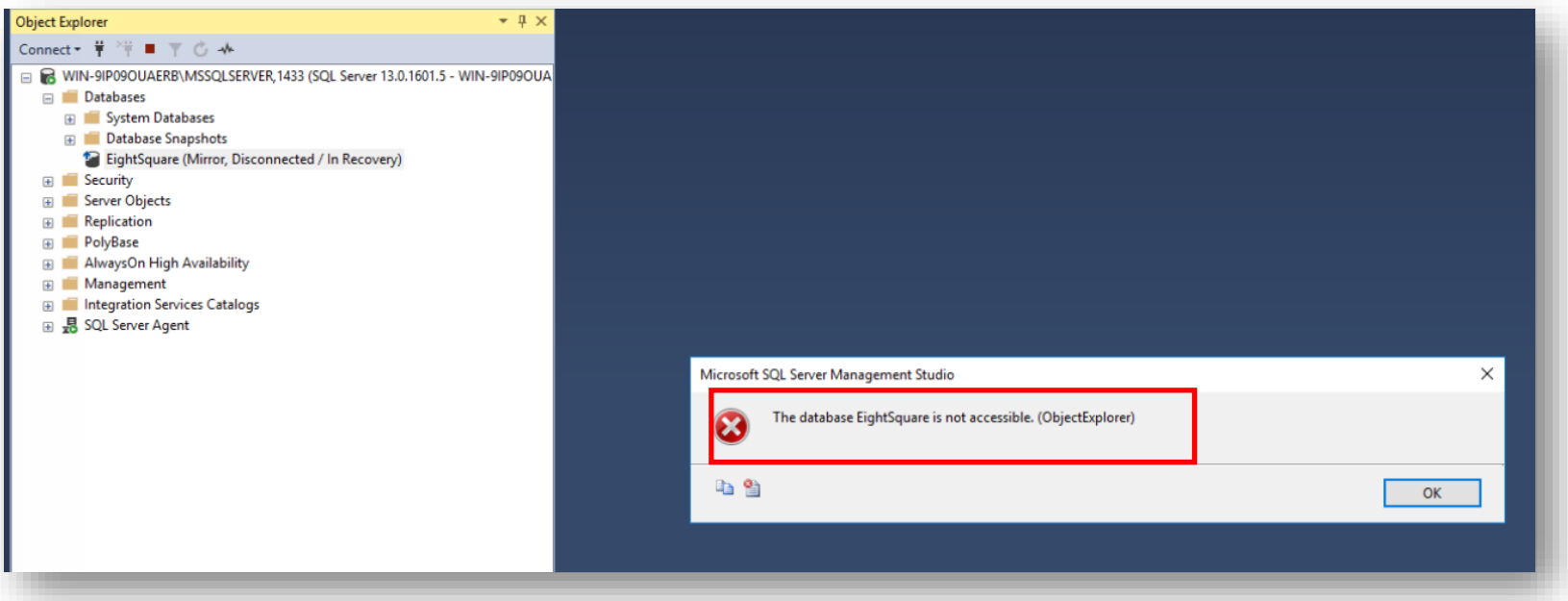

Database Properties - EightSquare
Select a page
General
Files
Filegroups
Options
Change Tracking
Permissions
Extended Properties
Mirroring
Transaction Log Shipping
Script
Help
Ensure that security is configured for mirroring this database.
Configure Security...
Server network addresses
Principal:
TCP://WIN-KOB3V8MHTBK:5022
Start Mirroring
Mirror:
TCP://WIN-9IP09OUAERB.localdom
Pause
Witness:
Remove Mirroring
Database Properties
One or more of the server network addresses lacks a fully qualified domain name (FQDN). To start mirroring without using a FQDN, click "Yes." To specify the FQDN, click "No." Then, specify every TCP address by using the syntax for a fully qualified TCP address, and click Start Mirroring again.
This syntax is:
TCP://<computer_name>.<domain_segment>[.<domain_segment>]:<port>
Yes
No
automatic failover to the mirror if the principal becomes unavailable.
Server:
WIN-KOB3V8MHTBK\VMSQLSE
Connection:
WIN-KOB3V8MHTBK\Administrat
View connection properties
Progress
Ready
Status:
This database has not been configured for mirroring
Refresh
OK
Cancel


Database Properties - EightSquare
Select a page
General
Files
Filegroups
Options
Change Tracking
Permissions
Extended Properties
Mirroring
Transaction Log Shipping
Script
Help
Ensure that security is configured for mirroring this database.
Configure Security...
Server network addresses
Principal:
TCP://WIN-KOB3V8MHTBK:5022
Start Mirroring
Mirror:
TCP://WIN-9IP09OUAERB.localdom
Pause
Witness:
Remove Mirroring
Note: Use fully-qualified TCP addresses. For example:
TCP://svr5.corp.abc.com:5022
Failover
Operating mode
High performance (asynchronous) – Commit changes at the principal and then transfer them to the mirror.
High safety without automatic failover (synchronous) – Always commit changes at both the principal and mirror.
High safety with automatic failover (synchronous) – Requires a witness server instance. Commit changes at both the principal and mirror if both are available. The witness controls automatic failover to the mirror if the principal becomes unavailable.
Connection
Server:
WIN-KOB3V8MHTBK\VMSQLSE
Connection:
WIN-KOB3V8MHTBK\Administrat
View connection properties
Progress
Ready
Status:
Synchronized: the databases are fully synchronized
Refresh
OK
Cancel

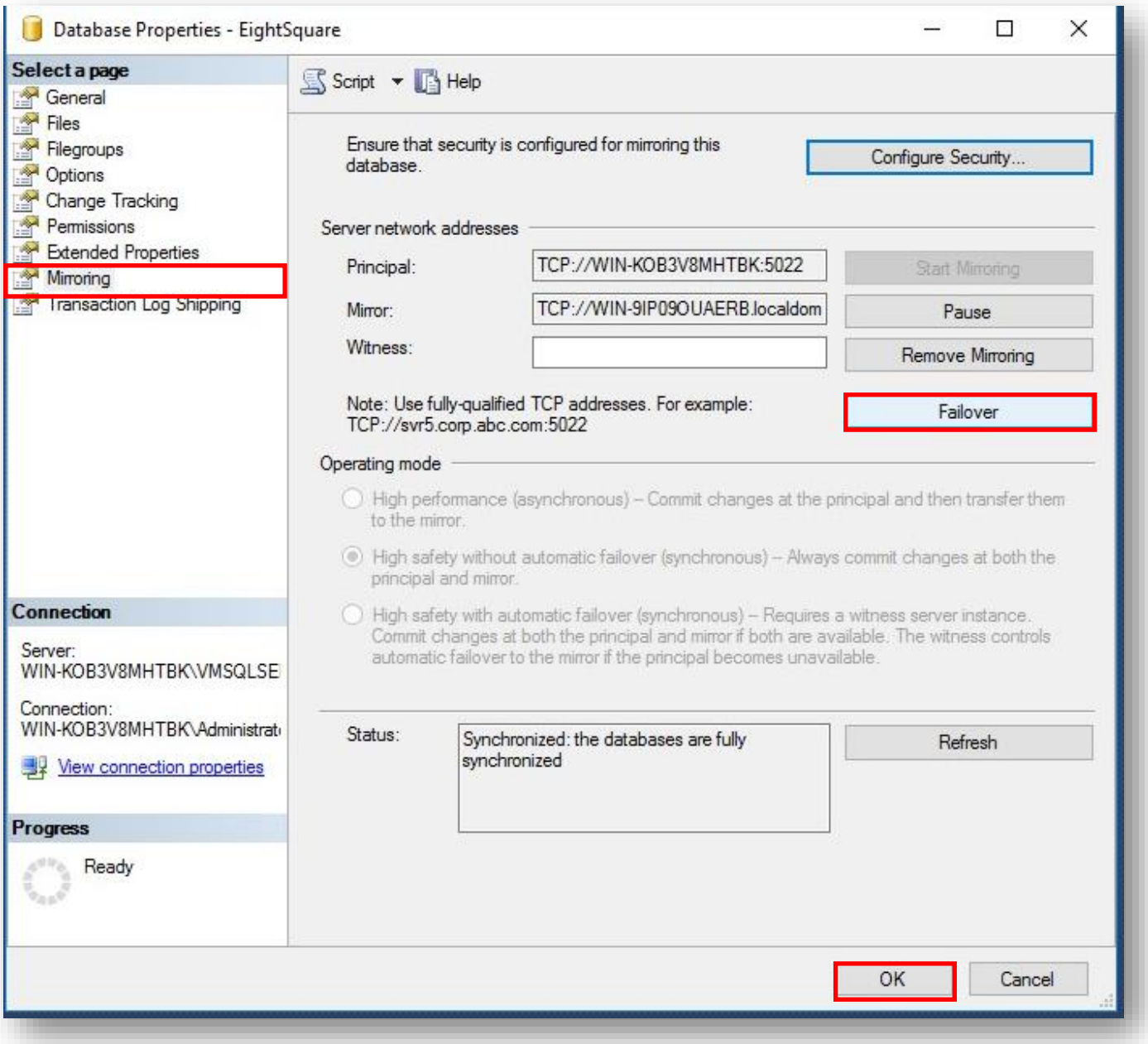

Object Explorer
Connect
WIN-KOB3V8MHTBK\VMSQLSERVER,1433 (SQL Server 13.0.1742.0 - WI
Databases
System Databases
Database Snapshots
EightSquare (Principal, Synchronized)
ReportServer$VMSQLSERVER
ReportServer$VMSQLSERVERTempDB
Security
Server Objects
Replication
AlwaysOn High Availability
Management
Integration Services Catalogs
SQL Server Agent

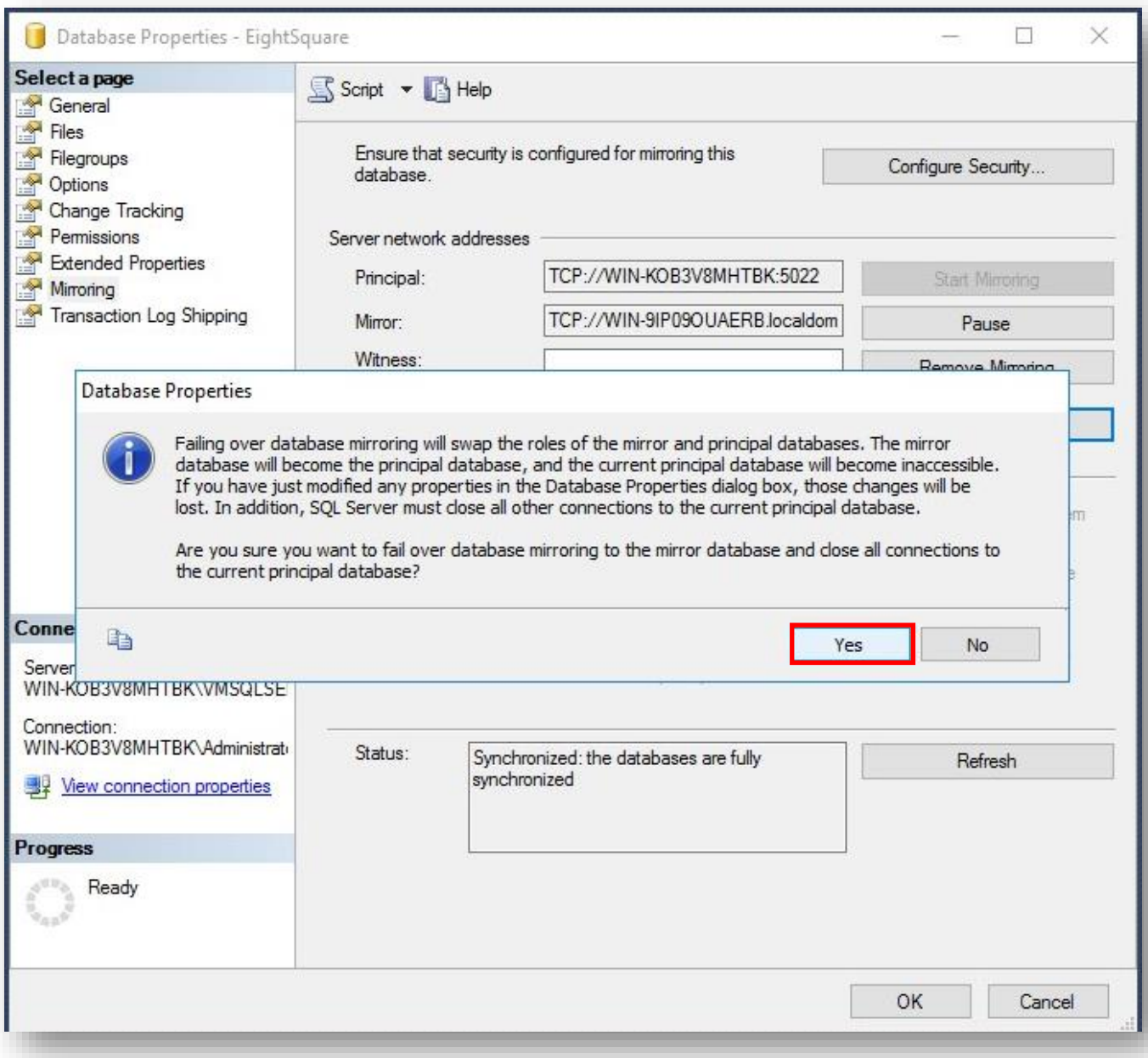
Object Explorer
Connect
WIN-9IP09OUAERB\MSSQLSERVER,1433 (SQL Server 13.0.1601.5 - WIN-9IP09OUA
Databases
System Databases
Database Snapshots
EightSquare (Mirror, Synchronized / Restoring...)
Security
Server Objects
Replication
PolyBase
AlwaysOn High Availability
Management
Integration Services Catalogs
SQL Server Agent

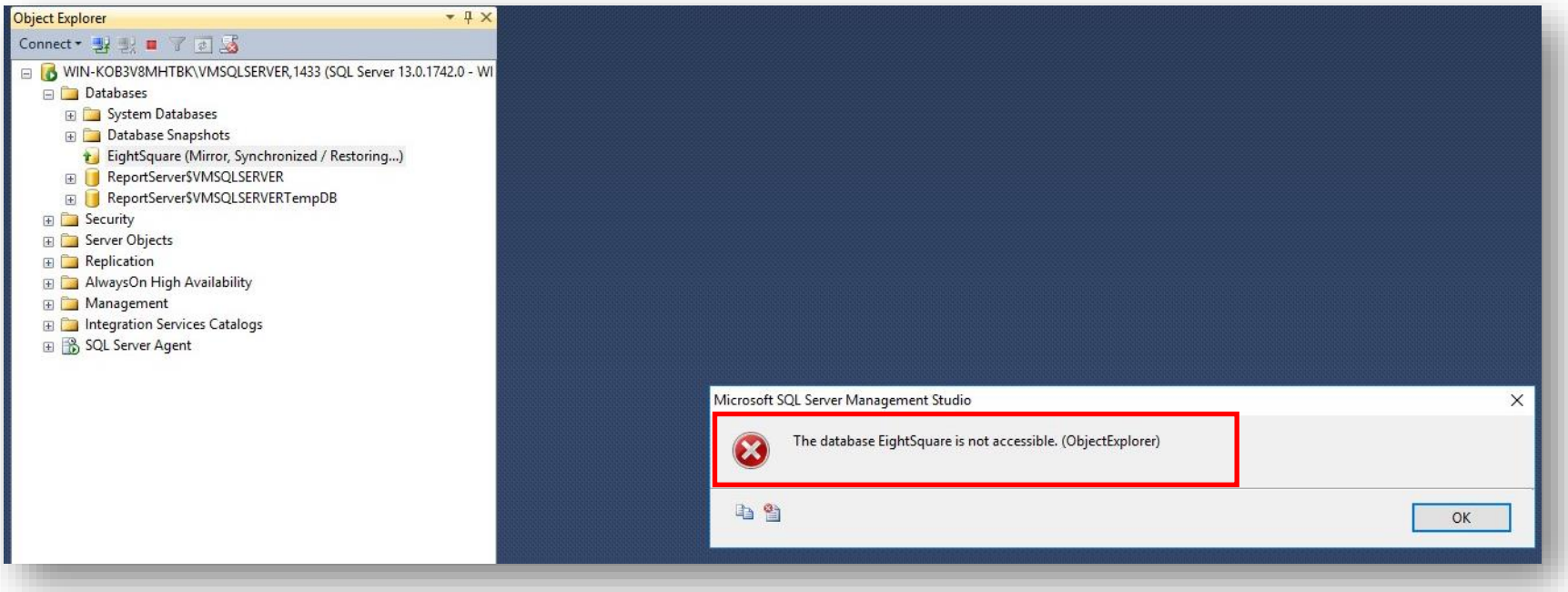

Object Explorer
Connect
WIN-KOB3V8MHTBK\VMSQLSERVER,1433 (SQL Server 13.0.1742.0 - WI
Databases
System Databases
Database Snapshots
New Database...
New Query
Script Database as
Tasks
Policies
Facets
Start PowerShell
Reports
Rename
Delete
Refresh
Properties
Security
Replication

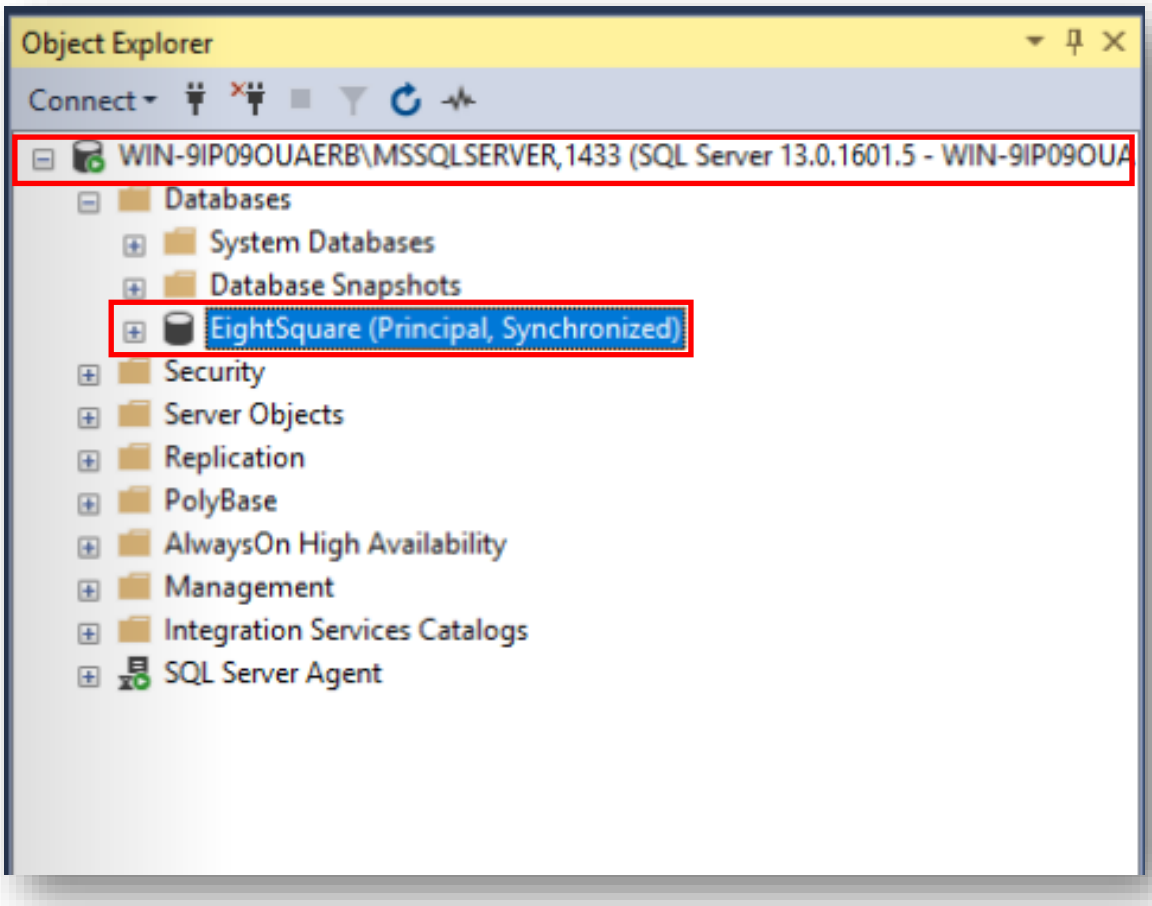

Object Explorer
Connect
WIN-9IP09OUAERB\MSSQLSERVER,1433 (SQL Server 13.0.1601.5 - WIN-9IP09OUA
Databases
System Databases
Database Snapshots
EightSquare (Mirror, Disconnected / In Recovery)
Security
Server Objects
Replication
PolyBase
AlwaysOn High Availability
Management
Integration Services Catalogs
SQL Server Agent
Microsoft SQL Server Management Studio
The database EightSquare is not accessible. (ObjectExplorer)
OK

Object Explorer
Connect
WIN-KOB3V8MHTBK\VMSQLSERVER,1433 (SQL Server 13.0.1742.0 - WI
Databases
System Databases
Database Snapshots
EightSquare (Principal
ReportServer$VMSQLS
ReportServer$VMSQLS
Security
Server Objects
Replication
AlwaysOn High Availabilit
Management
Integration Services Catal
SQL Server Agent
New Database...
New Query
Script Database as
Tasks
Policies
Facets
Start PowerShell
Reports
Rename
Delete
Refresh
Properties
Detach...
Take Offline
Bring Online
Shrink
Back Up...
Restore
Mirror...
Launch Database Mirroring Monitor...
Ship Transaction Logs...
Generate Scripts...
Extract Data-tier Application...
Deploy Database to Windows Azure SQL Database...
Deploy Database to a Windows Azure VM...
Export Data-tier Application...
Register as Data-tier Application...
Upgrade Data-tier Application...
Delete Data-tier Application...
Import Data...
Export Data...
Copy Database...
Manage Database Encryption...


Database Properties - EightSquare
Select a page
General
Files
Filegroups
Options
Change Tracking
Permissions
Extended Properties
Mirroring
Transaction Log Shipping
Script
Help
Ensure that security is configured for mirroring this database.
Configure Security...
Server network addresses
Principal:
TCP://WIN-KOB3V8MHTBK:5022
Start Mirroring
Mirror:
TCP://WIN-9IP09OUAERB.localdom
Pause
Witness:
Remove Mirroring
Note: Use fully-qualified TCP addresses. For example: TCP://svr5.corp.abc.com:5022
Failover
Operating mode
High performance (asynchronous) – Commit changes at the principal and then transfer them to the mirror.
High safety without automatic failover (synchronous) – Always commit changes at both the principal and mirror.
High safety with automatic failover (synchronous) – Requires a witness server instance. Commit changes at both the principal and mirror if both are available. The witness controls automatic failover to the mirror if the principal becomes unavailable.
Connection
Server:
WIN-KOB3V8MHTBK\VMSQLSE
Connection:
WIN-KOB3V8MHTBK\Administrat
View connection properties
Progress
Ready
Status:
Synchronized: the databases are fully synchronized
Refresh
OK
Cancel


Database Properties - EightSquare
Select a page
General
Files
Filegroups
Options
Change Tracking
Permissions
Extended Properties
Mirroring
Transaction Log Shipping
Script
Help
Ensure that security is configured for mirroring this database.
Configure Security...
Server network addresses
Principal:
TCP://WIN-KOB3V8MHTBK:5022
Start Mirroring
Mirror:
TCP://WIN-9IP09OUAERB.localdom
Pause
Witness:
Database Properties
Failing over database mirroring will swap the roles of the mirror and principal databases. The mirror database will become the principal database, and the current principal database will become inaccessible. If you have just modified any properties in the Database Properties dialog box, those changes will be lost. In addition, SQL Server must close all other connections to the current principal database.
Are you sure you want to fail over database mirroring to the mirror database and close all connections to the current principal database?
Yes
No
Connection:
WIN-KOB3V8MHTBK\Administrat
View connection properties
Progress
Ready
Status:
Synchronized: the databases are fully synchronized
Refresh
OK
Cancel


Object Explorer
Connect
WIN-KOB3V8MHTBK\VMSQLSERVER,1433 (SQL Server 13.0.1742.0 - WI
Databases
System Databases
Database Snapshots
EightSquare (Mirror, Synchronized / Restoring...)
ReportServer$VMSQLSERVER
ReportServer$VMSQLSERVERTempDB
Security
Server Objects
Replication
AlwaysOn High Availability
Management
Integration Services Catalogs
SQL Server Agent
Microsoft SQL Server Management Studio
The database EightSquare is not accessible. (ObjectExplorer)
OK


Object Explorer
Connect
WIN-9IP09OUAERB\MSSQLSERVER,1433 (SQL Server 13.0.1601.5 - WIN-9IP09OUA
Databases
System Databases
Database Snapshots
EightSquare (Principal, Synchronized)
Security
Server Objects
Replication
PolyBase
AlwaysOn High Availability
Management
Integration Services Catalogs
SQL Server Agent