

MIRRORING: START TO FINISH

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2012 MAY, 10-11
DALLAS, TX

Objectives

- ▶ Define Mirroring
- ▶ Describe how mirroring fits into HA and DR
- ▶ Terminology
- ▶ The Rules
- ▶ What's new in 2008 mirroring?
- ▶ Demo – How to configure mirroring
- ▶ Other Considerations
- ▶ Demo - Monitoring Mirroring



What is mirroring?

Where does Mirroring fit in?

- What is the difference between HA and DR?
- Which business requirement does mirroring solve?

What are my other HA/DR Options?

- Clustering – HA only until server 2008
- Transactional Replication – HA & DR
- Peer to Peer Replication – HA & DR
 - Think Mesh topology or AD replication
- Log Shipping – HA & DR
- Backups - DR



Terminology

Terms

- ▶ Principal
- ▶ Mirror
- ▶ Witness
- ▶ Endpoint
- ▶ Session
- ▶ State – 5 states
- ▶ Mode – 3 modes

Session States

- Synchronizing
- Synchronized
- Suspended
- Pending Failover
- Disconnected

Modes

- High Safety with Automatic Failover
- High Safety without Automatic Failover
- High Performance



The Rules

Rules

- You cannot mirror any system DBs
- High Performance requires Enterprise Edition
- Witness can be any edition including workgroup, web, and express
- Automatic failover requires a witness
- DB must be in full recovery mode
- You cannot mirror a DB that uses Filestream
- Maintenance plans do not support mirroring until SQL 2005 SP2 CU10
- Avoid local system for SQL service account
- Database compatibility level must be greater than 90 (SQL 2005)
- Peer to Peer Replication cannot be used in conjunction with mirroring.

What's new for mirroring in SQL 2008

1

- Log Stream Compression

2

- Automatic Page Recovery

3

- Better use of log stream buffers

4

- Additional performance counters

What's new for mirroring in SQL 2012





How it Works

Synchronous Mode

Principal

- Transaction Inserted in Log
- Transaction Read from Log
- Transaction Shipped to Mirror

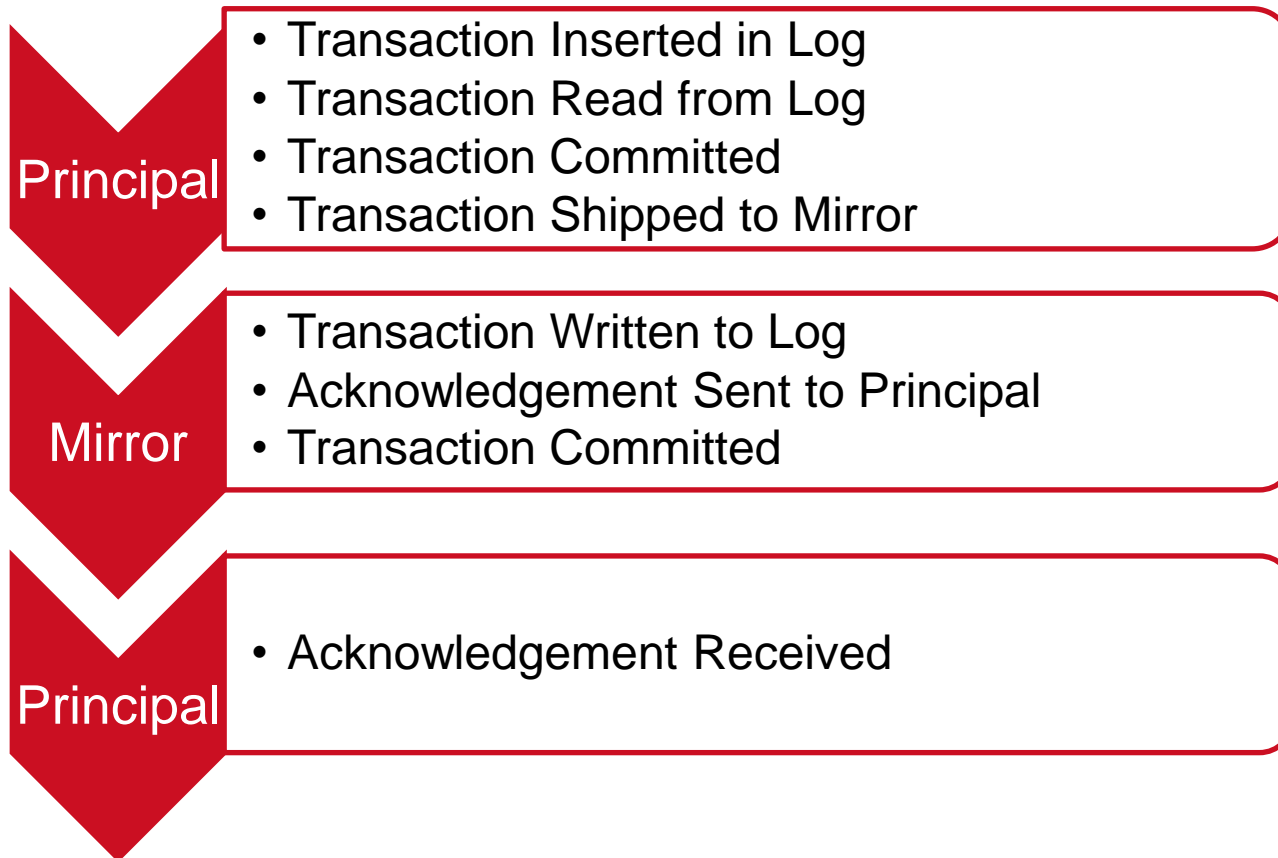
Mirror

- Transaction Written to Log
- Acknowledgement Sent to Principal
- Transaction Committed

Principal

- Acknowledgement Received
- Transaction Committed

Asynchronous Mode



Configuration Steps

- ▶ Restore DB and Log Backup on Mirror with no recovery
- ▶ Create Mirroring Endpoints
- ▶ Create Logins for SQL Service Account
- ▶ Grant Connect on Endpoints to Logins
- ▶ Set Principal Partner on Mirror
- ▶ Set Mirror Partner on Principal
- ▶ Set Failover Timeout



Demo

Comparison

Mirroring

- DB replicated to one other instance
- Transactions shipped real time
- Mirror DB not available for queries (Snapshot)
- Data is compressed over the wire
- Automatic page recovery

Log Shipping

- DB replicated to many other instances
- Transactions shipped on a schedule
- Secondary DB available for queries
- Only compressed if log backups are compressed
- No page recovery



Other Considerations

Is Your Mirror Server Prepared?

- Logins
- SQLAgent Jobs
- SSIS Packages
- Linked Servers
- Database Level Options
 - Change owner on mirror
 - Set Trustworthy option on mirror
- Instance Level Options
 - Enable CLR
 - Database Mail
 - Extended SPs like xp_cmdshell



Monitoring

Mirror Monitoring

- ▶ Where is the data stored
 - ▶ msdb.dbo.dbm_monitor_data
 - ▶ Performance Counter Root Location
 - ▶ SQLServer:Database Mirroring
 - ▶ MSSQL\$InstanceName:Database Mirroring
- ▶ How to view the data
 - ▶ Database Mirroring Monitor
 - ▶ System Stored Procedures
 - ▶ Sp_dbmmonitorresults
 - ▶ Sp_dbmmonitorchangealert
 - ▶ Sp_dbmmonitorhelpalert
 - ▶ Sp_dbmmonitordropalert
 - ▶ Perfmon



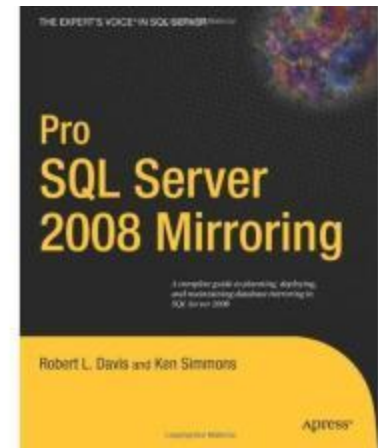
Demo

Summary

- ▶ Mirroring Defined
- ▶ Business Requirements Defined
- ▶ Terminology Defined
- ▶ Rules Defined
- ▶ Configuration Steps
- ▶ Monitoring

Resources

- Pro SQL Server 2008 Mirroring
- Robert Davis
 - Twitter - @SQLSoldier
 - Web - <http://www.sqlsoldier.com/>
- Ken Simmons
 - Twitter – @KenSimmons
 - Web – CyberSQL.blogspot.com
- Ryan Adams – Copy Logins Script
<http://www.ryanjadams.com/2010/09/automate-sql-logins-to-dr-site/>



Slides and Code

<http://www.ryanjadams.com/presentations>

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QUESTIONS?