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

Deprecated
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

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

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

Principal
- Acknowledgement Received
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
  • Ken Simmons
    • Twitter – @KenSimmons
    • Web – CyberSQL.blogspot.com

• Ryan Adams – Copy Logins Script

Slides and Code
http://www.ryanjadams.com/presentations

Ryan Adams
Blog - http://ryanjadams.com
Twitter - @ryanjadams
Email – ryan@ryanjadams.com

QUESTIONS?