

SQL Server Loadfest R2

Lesson 2 – Before the Install

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What We'll Learn

- Preparing the OS
- Support for Virtual Environments
- Preparing Storage
- Preparing Security

Preparing the OS

- Which Windows Server 2008 R2?
- OS Components
 - IIS – No longer needed
 - SMTP, WMI, optional but recommended
- Page file 1.5 x Memory
- Install these before SQL Server

Support for Virtual Environments

- Windows Server 2008 R2 – Hyper V
- Server Virtualization Validation Program

Supported Server OS

- Windows Server 2008 and 2008 R2
- Windows Server 2003 SP2 and above

Desktop Operating Systems

- Windows XP, SP3
- Vista
- Windows 7

Preparing Storage

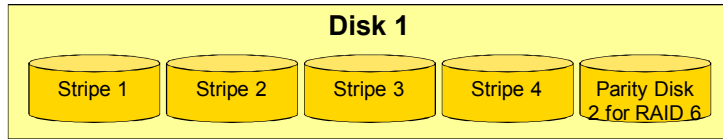
- RAID
- Partition Offset
- Formatting the Drives
- Instant File Initialization
- Benchmarking with SQLIO



RAID

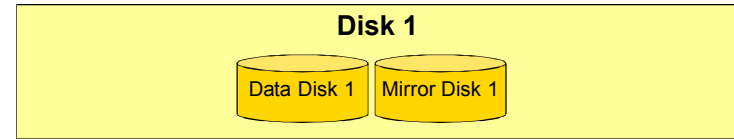
- Redundant Array of Inexpensive Disks
- Multiple Drives Used to provide:
 - Performance
 - Protection from Failure

RAID 5/6



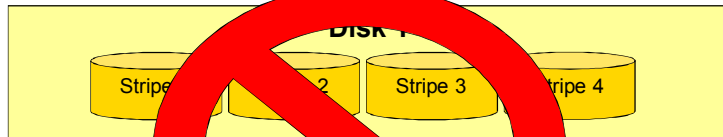
- Protects from single drive failures
- Good read performance
- Slower on writes
- Low storage overhead (for 4+1 oh=20%)

Raid 1 - Mirroring



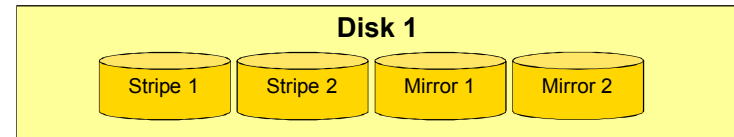
- Protects from single disk failure
- Good on Reads
- Okay on Writes
- 100% Storage overhead

RAID 0 – Stripe Set



- No protection from single drive failure
- Very good read and write performance
- No storage overhead

RAID 10 – Mirrored Stripe



- Protects from Single Drive Failure
- Good Read and Write Performance
- 100% Storage overhead

Partition Offset

- Windows disk layout causes extra I/O
- DISKPART – Can be used to fix (ALIGN=1024)
- Must be done before FORMAT
- Windows Server 2008 has fixed this issue

Demo – DISKPART

- DISKPART

```
CREATE PARTITION PRIMARY ALIGN=1024
```

```
DISKPART> list partition
There are no partitions on this disk to show.
DISKPART> create partition primary align=1024
DiskPart succeeded in creating the specified partition.
DISKPART> list partition
  Partition ###  Type              Size      Offset
  -----
* Partition 1   Primary           100 GB   1024 KB
DISKPART>
```

Formatting – Allocation Unit

- I/O Chunk Size
 - 512 Bytes is the default
 - 8K for random I/O
 - 64K or 256K for highly sequential DBs
- NTFS comprssion not supported if allocation unit size > 4096

Demo - FORMAT

```
FORMAT /FS:NTFS /V:EXTERN100 /Q /A:8192
```



```
D:\>FORMAT M: /FS:NTFS /V:Extern100 /Q /A:8192
The type of the file system is RAW.
The new file system is NTFS.

WARNING, ALL DATA ON NON-REMOVABLE DISK
DRIVE M: WILL BE LOST!
Proceed with Format (Y/N)? Y
QuickFormatting 102397M
Creating file system structures.
Format complete.
104855224 KB total disk space.
104787864 KB are available.
D:\>
```

Instant File Initialization

- Speeds the allocation of space
- Give the service account the privilege

SE_MANAGE_VOLUME_NAME

“Perform Volume Maintenance”
- Does not apply to log files

Benchmark Performance

- Take a measurement!
- SQLIO
- IOMETER

DEMO - Benchmark

```
SQLIO -kW -t2 -s120 -dM -frandom -b8 -BH -LS testfile.dat
C:\Program Files (x86)\SQLIO>sqlio -kW -t2 -s120 -frandom -b8 -BH -LS testfile.d
at
sqlio v1.5.sg
using system counter for latency timings, 1995000000 counts per second
2 threads writing for 120 secs to file testfile.dat
using 8KB random I/Os
buffering set to use hardware disk cache (but not file cache)
using current size: 8 MB for file: testfile.dat
initialization done
CUMULATIVE DATA:
throughput metrics:
I/Os/sec: 509.00
MBs/sec: 3.97
latency metrics:
Min_Latency(ms): 0
Avg_Latency(ms): 3
Max_Latency(ms): 264
histogram:
ms: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24+
%: 95 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 5
C:\Program Files (x86)\SQLIO>
```

Preparing Security

- What is a service
 - A program running without a User Interface
- What account does a service run as:
 - LocalSystem
 - LocalService
 - NetworkService
 - Local User / Domain User

Recommendation

- Most services should be Domain User
- Network Service for SSIS
- Local User when domain unavailable

What We Learned

- OS Preparation
- Disk preparation
- Security – Create your domain users.

What's Next

- Hands on Install of SQL Server 2008 R2