

SQL Server Loadfest

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?
 - IIS, if Reporting Services
 - SMTP, WMI, optional but recommended
- § OS Components
- § Page file 1.5 x Memory
- § Install these before SQL Server

Support for Virtual Environments

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

Supported Server OS

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

Desktop Operating Systems

- § Windows XP, SP2 and SP3
- § Vista
- § Windows 7, Not yet

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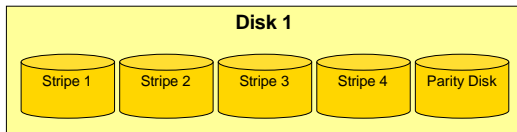
Preparing Storage

- § RAID
- § Partition Offset
- § Formatting the Drives
- § Instant File Initialization

RAID

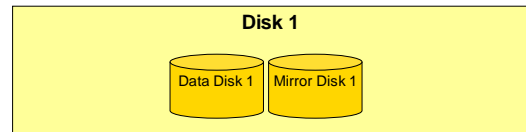
- § Redundant Array of Inexpensive Disks
- § Multiple Drives Used to provide:
 - Performance
 - Protection from Failure

RAID 5



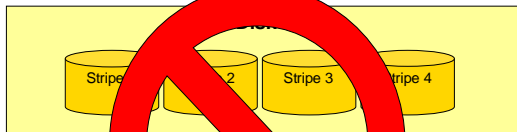
- § Protects from single drive failures
- § Good read performance
- § Slower on writes
- § Low storage overhead (for 4+1 oh=20%)

Raid 1 - Mirroring



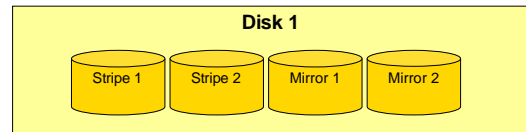
- § Protects from single disk failure
- § Good on Reads
- § Okay on Writes
- § 100% Storage overhead

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

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Partition Offset

- § Windows disk layout causes extra I/O
- § DISKPART – Can be used to fix
- § 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
  -----
P 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

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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.dat
sqlio v1.5.56
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+
n: 95 0 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