



LAN/Server Free* Backup Experiences

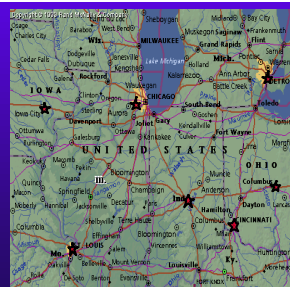
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* Beware ambiguous terminology



Who is Solution Technology

- ◆ IBM Premier Business Partner
- ◆ \$70M+ in Sales
- ◆ 80+ Employees
- ◆ 700 years of IT Sales and Services Experience
- ◆ One of the Fastest Growing Companies in Midwest
- ◆ Indiana's Growth 100
- ◆ Midwest Focused
- ◆ IBM Leadership Award for six consecutive years

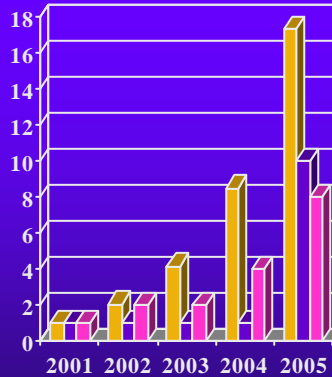


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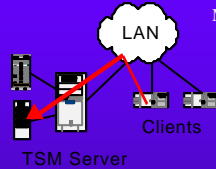
Why change now?

- ◆ Gartner: disk storage growing at 104% CAGR
- ◆ Tape, SAN capacity, rate double every 18 months (LTO)
- ◆ LAN capacity increase 10x every 5 years
- ◆ Growth mostly database, needs full backup, breaks progressive methodology
- ◆ Vanishing backup window
- ◆ SAN enables alternative approaches



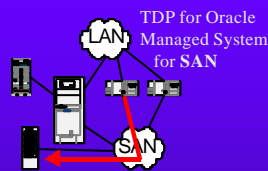
The Four Topologies

Traditional



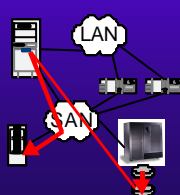
TDP for Oracle
Managed System
for LAN

LAN Free



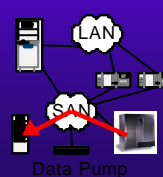
TDP for Oracle
Managed System
for SAN

Server Free 1



TDP for Oracle
TDP for ESS
RS6000/AIX
ESS Flashcopy

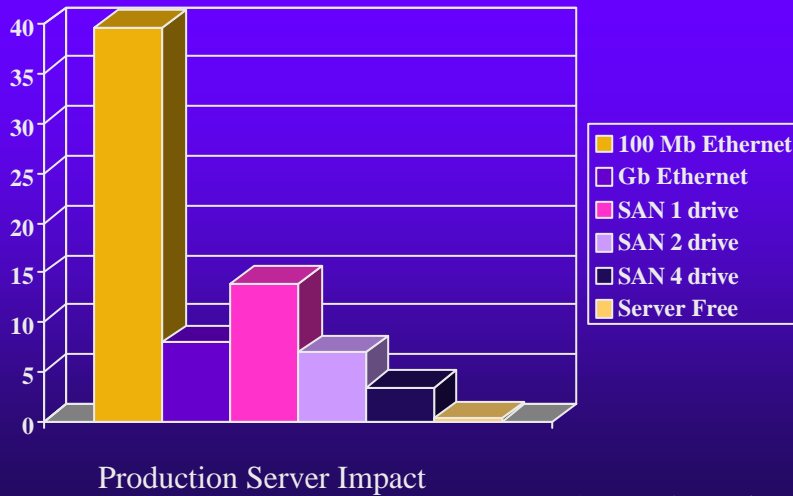
Server Free 2



Future -
nothing further
here



Relative Backup Time (estimate)



Traditional TDP Agent

- ◆ Slow: limited to LAN speed, about 25GB/Hour with 100M Ethernet
- ◆ Not scalable
- ◆ Cheap
 - Uses Existing LAN
 - About \$1450 for TSM SW (list)
- ◆ Simple
- ◆ Consumes LAN Bandwidth, TSM Server cycles
- ◆ Ethernet inherently unsuitable for block transfer
 - GB Ethernet maxes out at about 100GB/Hour
 - Very heavy client CPU requirements



LAN Free TDP Agent

- ◆ Fast: 50 – 100GB/hour per tape drive
- ◆ Scalable: Add tape drives, SAN Links
- ◆ Expensive
 - Needs SAN: \$4000 - \$7000 per connection
 - About \$4200 for TSM SW (list)
- ◆ More complicated
- ◆ High impact on production server
- ◆ Needs very fast client disk hardware



LAN Free Lab Hardware

- ◆ TSM Server – Sun Enterprise 250
- ◆ Application Server/TSM Client
 - Compaq DL380, 640MB, 2 800MHZ Processors
 - 5 GB Microsoft SQL Server Database
- ◆ Enterprise Storage Server
- ◆ Storage Area Network
 - McData 2032 Director
 - IBM 2108-R03 SDG (FC to SCSI Converter)
- ◆ IBM LTO 3583 Library
 - 2 Drives, 15/30 MB/second
 - 100/200 GB LTO Tape

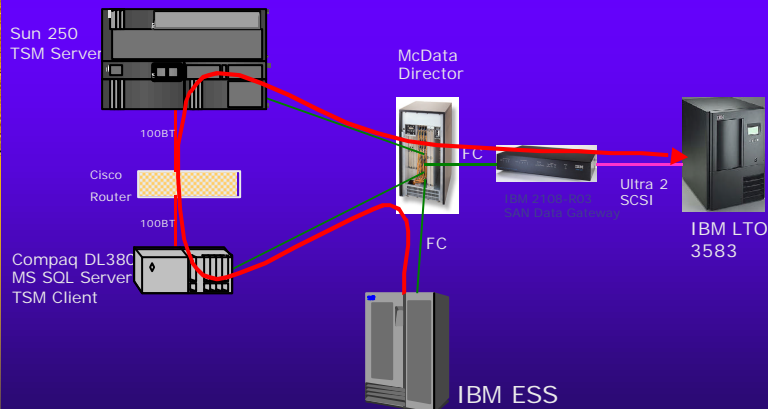


LAN Free Lab Software

- ◆ Solaris 8, TSM Server 4.1.3
- ◆ NT SP6, TSM Client 4.1.2.12
- ◆ NT Storage Agent 4.1.3
- ◆ SQL Server 7.0 SP2
- ◆ TDP for SQL 2.2



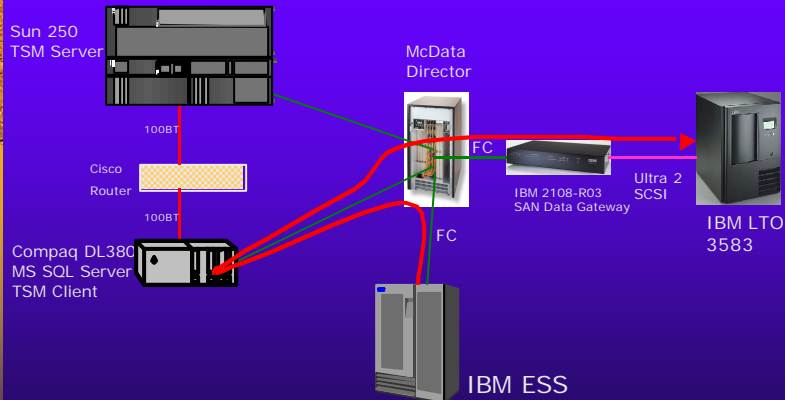
LAN Free Lab Traditional Data Path





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LAN Free Lab LANFree Data Path



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LAN Free Lab Observations

- ◆ Setup Time: 5 days!
 - Much trouble getting SAN to work
 - NT HBA Firmware
 - LTO Firmware
 - SDG Firmware
 - NT Drivers
 - McData setup
 - Solaris IBMtape driver setup
 - Storage Agent setup instructions not clear

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LAN Free Lab Observations (cont'd)

◆ Performance

- Traditional: 30GB/hour
 - Limited by LAN speed
- LAN Free: 108GB/hour to 2 drives
 - Limited by NT CPUs
- Performance sensitive to database disk type
 - Internal SCSI disk slow
 - ESS disk performed well



LAN Free Lab Observations (cont'd)

◆ Surprises

- LAN Free startup time: about 1 minute before data starts to move
- SAN sensitive to physical changes, needed to reboot SAN (!) repeatedly
- Setup very sensitive to different components software versions
 - Get latest versions of software, firmware
- Degree of load on NT server
- Great LTO drive throughput



LAN Free Prod Environment

- ◆ TSM Server – RS6000 H80 AIX 4.3.3 ML6
- ◆ Application Server/TSM Client
 - IBM Netfinity 5100, 1024MB, 2 933MHZ Processors
 - 70 GB Microsoft SQL Server Database
- ◆ Enterprise Storage Server
- ◆ Storage Area Network
 - Brocade 16 port switch
- ◆ IBM LTO 3583 Library (FC)
 - 3 Drives, 15/30 MB/second
 - 100/200 MB LTO Tape
- ◆ Same software, drivers as lab



LAN Free Prod Observations

- ◆ Setup Time: 1/2 day
 - No trouble with software or drivers
 - Some learning required for Brocade zoning
- ◆ Performance
 - 120GB/hour/2 drives
- ◆ Surprises
 - Worked first time
 - Even better LTO throughput



Server Free: TDP for ESS

- ◆ Near instantaneous backup, restore (flashback)
- ◆ Scalable: Add tape drives
- ◆ Very Expensive
 - Prefer SAN: \$4000 - \$7000 per connection
 - Need ESS: \$250K and up
 - About \$62,500 for TSM SW (list)
- ◆ Very complicated
- ◆ Negligible impact on production server
- ◆ Moderate impact on TSM server



TDP for ESS Lab Hardware

- ◆ TSM Server – IBM RS6000 44P
- ◆ Application Server/TSM Client
 - RS6000 44P
 - 6 GB Oracle Database
- ◆ Enterprise Storage Server
- ◆ Storage Area Network
 - McData 2032 Director
 - IBM 2108-R03 SDG (FC to SCSI Converter)
- ◆ IBM LTO 3583 Library
 - 2 Drives, 15/30 MB/second
 - 100/200 MB LTO Tape



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TDP for ESS Lab Software

- ◆ AIX 4.3.3, TSM Server 4.1.3
- ◆ AIX 4.3.3, TSM Client 4.1.2
- ◆ Oracle 8.1.6
- ◆ TDP for Oracle 2.1.10
- ◆ TDP for ESS 1.1.0

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TDP for ESS Lab Observations

- ◆ Setup Time: 4 days
 - Lack of experience with Oracle, RMAN setup
 - Paucity of documentation on TDP for ESS setup (Redbook came out later)
- ◆ Performance: Total “backup” time < 10 sec
 - Data copied to tape in background from TSM server

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TDP for ESS Lab Observations (cont'd)

- ◆ Surprises
 - Pretty well engineered for a V1 product
 - RMAN integration worked ok
 - Much “under the cover” functionality
 - Lots of scripts



TDP for ESS Prod Hardware

- ◆ TSM Server – RS6000 H80
- ◆ Application Server/TSM Client
 - S80 HA pair
 - 400 GB Oracle Database
- ◆ Enterprise Storage Server
- ◆ Storage Area Network
 - Five Brocade 16 port switches (mesh topology)
- ◆ IBM 3494/3590 (FC)
 - 4 E series drives, 14/40 MB/second
 - 40/80 GB Magstar Tape



TDP for ESS Prod Software

- ◆ AIX 4.3.3 ML7, TSM Server 4.1.3
- ◆ AIX 4.3.3 ML7, TSM Client 4.1.2
- ◆ HACMP/ES 4.4.0
- ◆ Oracle 8.1.7 with Parallel Server option
- ◆ TDP for Oracle 2.1.10
- ◆ TDP for ESS 1.1.0



TDP for ESS Prod Observations

- ◆ Implementation Failure!
 - Oracle 8.1.7 not supported
 - Oracle Parallel Server not supported
 - Subsystem Device Driver (SDD) was not supported with TDP for ESS (patch now available)
- ◆ Implementation on hold



Conclusion

- ◆ LAN/Server Free techniques can increase availability and backup efficiency
- ◆ New approaches move the bottleneck
- ◆ Lab testing is key to successful implementation of advanced features
- ◆ Tivoli support statements are precise: check with support unless your exact configuration is listed