













HP SAS Hard Drives and ProLiant Solutions

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Small Form Factor Serial SCSI (SAS) is the Best Choice for Servers

	Ultra320 SCSI	Large Form Factor Serial Attached SCSI	Small Form Factor Serial Attached SCSI
Reliability	 1.5 million hours MTBF 0.6% Annual Failure Rate 24/7 duty cycle	 1.5 million hours MTBF 0.6% AFR 24/7 duty cycle	 1.75 million hours MTBF 0.5% AFR 24/7 duty cycle
Performance	 Parallel: Shared Bus BW... Limited by Bus Architecture Max bandwidth 320MB	 Point to Point Limited spindles/system. Performance limited by total HDD	 15%-20% higher IOs/S Point to Point More Spindles / System Faster rebuild times.
Power	 18 Watts/disk drive	 18Watts/disk drive	 9 Watts/disk drive
Usable Storage Density Solutions	 DL360w/300GB drives 1U w/ RAID 0 = 300GB usable storage	 DL360 w/300GB drives 1U w/ RAID 0 = 300GB usable storage	 6 Bay in DL360 (1U w/RAID 5 = 730GB Usable) 8 Bay in DL380 16 Bays in ML370

Ideal for servers

SAS + SATA + SFF = 1 transition !!!

- Take full advantage of Small Form Factor
 - At 72GB spot: over twice the capacity with SFF SAS
 - 18% more storage with 72GB SFF SAS over 146GB U320
 - ½ Power of 3.5" (9W versus 18W)
 - Lower Thermals (heat load)
 - More Spindles – faster drive re-build
- Minimize transition impact
 - Migrate to SFF & SAS in 1 Step

42U

HP pSCSI

HP SAS SFF



Near Price Parity per GB but 18% more Storage Capacity with SFF

U: unit rack height
1U = 1.75"

Anticipated Drive Pricing from HP in 4th calendar quarter 2006. Does not include server or MSA costs. Future Drive Pricing subject to change without notice.

SFF its about Spindles, performance and lower costs

Large Form Factor

1U/2P



2 15k 146GB LFF SAS

Total Storage: 292GB

Usable w/Raid: 146GB (No RAID 5)

Cost/Usable GB: \$9.71 (drives only)

\$/IOPS: \$1418/630 = \$2.25

\$/IOPS/GB = 0.7 cent

Small Form Factor



6 10k 72GB SFF SAS

Total Storage: 432GB

Usable w/Raid 5: 360GB

Cost/Usable: \$6.00 (drives only)

\$/IOPS: \$2154/1530 = \$1.41

\$/IOPS/GB = 0.3 cents

DL360

2U/2P



6 15k 146GB LFF SAS

Total Storage: 876GB

Usable w/Raid 5: 730GB

Cost/GB: \$4.86 (drives only)

Cost/Usable GB: \$5.83

\$/IOPS/GB = 0.3 cents



8 10k 146GB SFF SAS Drives in 2U

Total Storage: 1168GB

Usable w/Raid 5: 1022GB

Cost/GB: \$3.08 (drives only)

Cost/Usable GB: \$3.52

\$/IOPS/GB: 0.15 cents

DL380