

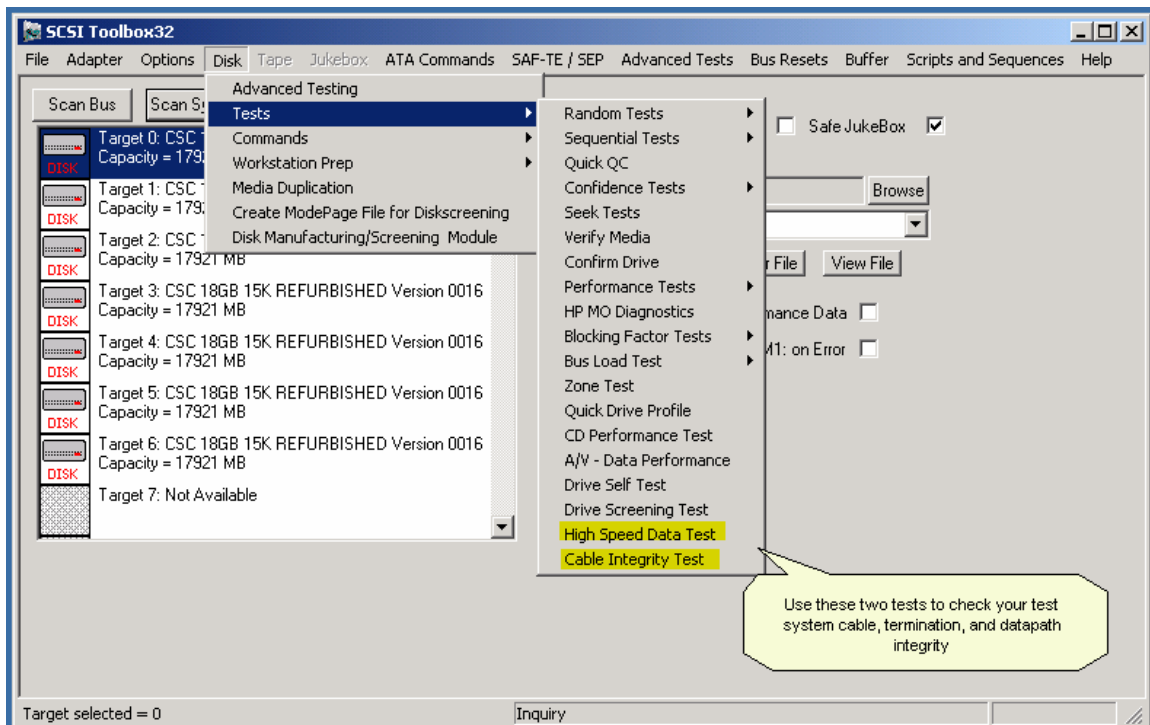
Test System Datapath Maintenance

It is important to have confidence in the integrity of the systems which you use for testing peripherals. For the most part, once the test system is configured properly it will be able to test reliably and give consistent repeatable results.

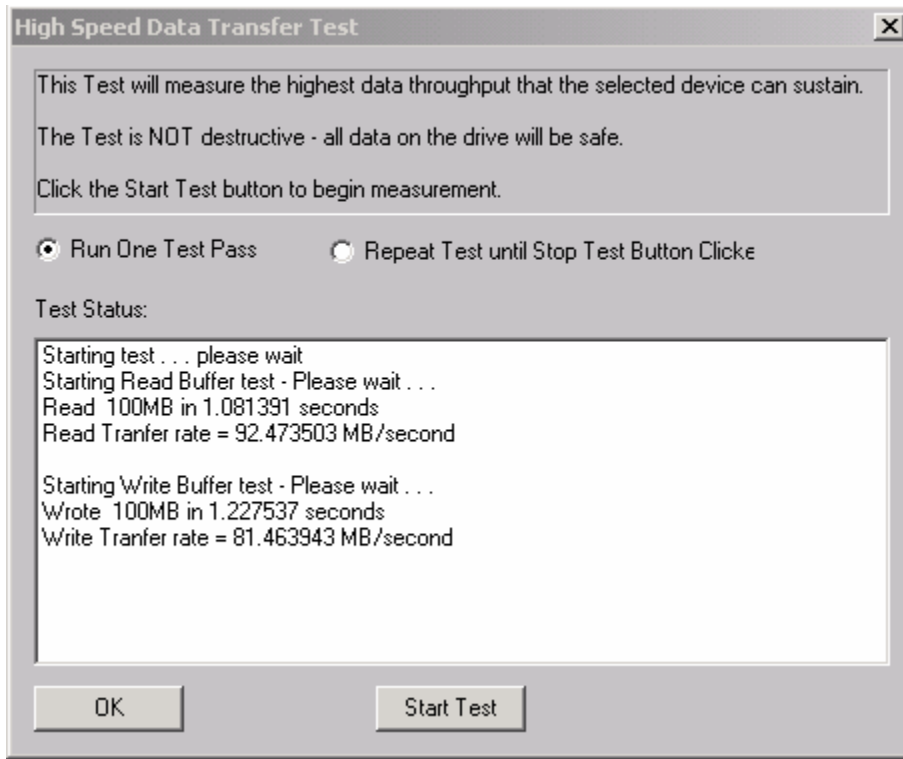
But there is a definite weak link in a typical peripheral test setup – the cables, backplanes, and other components used to connect the peripherals to the test system. Connectors can wear or become dirty, components within backplanes and terminators can fail, cables can become crimped and damaged. By the time these problems are occurring you may be seeing tests fail with bus parity errors or unexplained bus resets.

To keep a high level of confidence in your test system we recommend a periodical checkup of the peripheral data path. Depending on the level of use we recommend that you use the SCSItoolbox to run the High Speed Data Test and the Cable Integrity test at least once weekly on all of your test systems. These tests run data patterns designed to expose these exact problems. Be sure to connect a known-good disk drive to the far end of your cable – then run each of these tests. Our examples will also show the use of BAM to provide more information.

The tests are found in the SCSItoolbox Disk->Test menu as shown below:



First, run the High Speed Data Test – and for each of your test systems keep a log book, recording the resulting data transfer speeds as shown below:



Use BAM to capture the test as you run it, then use the Trace Performance Analysis tab, recording the read and write data transfer rates and IO latency rates in your log book –

The screenshot displays the BAM by SCSI Toolbox, LLC application window. The top section shows a table of captured SCSI commands. The bottom section, titled 'Trace Performance Analysis', contains a 'Summary Statistics' panel, a 'CDB Distribution' pie chart, and a 'Data Rate' line graph.

Ctrl	Device	Phase Type	CDB Desc	Data	Data Length	Delta	Driver
149	5:0:0	Data Out		FF FE FD FC FB FA F9 F8 F7 F6 F5 F4 F3 F2 F1 F0	2621440 Bytes	31.3 ms	
150	5:0:0	CDB	Write Buffer	3B 02 00 00 00 00 28 00 00 00	10 Bytes	196 us	stsclass
151	5:0:0	Data Out		FF FE FD FC FB FA F9 F8 F7 F6 F5 F4 F3 F2 F1 F0	2621440 Bytes	31.3 ms	
152	5:0:0	CDB	Write Buffer	3B 02 00 00 00 00 28 00 00 00	10 Bytes	174 us	stsclass
153	5:0:0	Data Out		FF FE FD FC FB FA F9 F8 F7 F6 F5 F4 F3 F2 F1 F0	2621440 Bytes	31.3 ms	
154	5:0:0	CDB	Write Buffer	3B 02 00 00 00 00 28 00 00 00	10 Bytes	177 us	stsclass
155	5:0:0	Data Out		FF FE FD FC FB FA F9 F8 F7 F6 F5 F4 F3 F2 F1 F0	2621440 Bytes	31.3 ms	
156	5:0:0	CDB	Write Buffer	3B 02 00 00 00 00 28 00 00 00	10 Bytes	166 us	stsclass
157	5:0:0	Data Out		FF FE FD FC FB FA F9 F8 F7 F6 F5 F4 F3 F2 F1 F0	2621440 Bytes	31.3 ms	

Summary Statistics:
 Total CDBs: 79
 W/R CDBs: 79 (R: 40, W: 39)
 Data bytes (k): 199680 (R: 99840, W: 99840)
 Capture Time: 2.20 Sec
 I/Os per Sec: 35.93
 Bus Utilization %: 100.00
 Percentage of W/R CDBs: 100.00%
 Read Transfer Rate - Avg: 92.93 High: 92.97
 Read Transfer Size - avg: 2555904.10
 Write Transfer Rate - Avg: 81.80 High: 81.81
 Write Transfer Size - avg: 2621440.00
 I/O Latency - Low: 149.00 Avg: 161.57 High: 306.00
 Incomplete CDBs: 0
 Maximum Queue Depth: 1

Data Rate Graph: Shows Write (red) and Read (yellow) data rates over time. The Y-axis ranges from 0 to 50.0, and the X-axis ranges from 0 to 100. Both rates show a sharp increase around X=40 and stabilize.

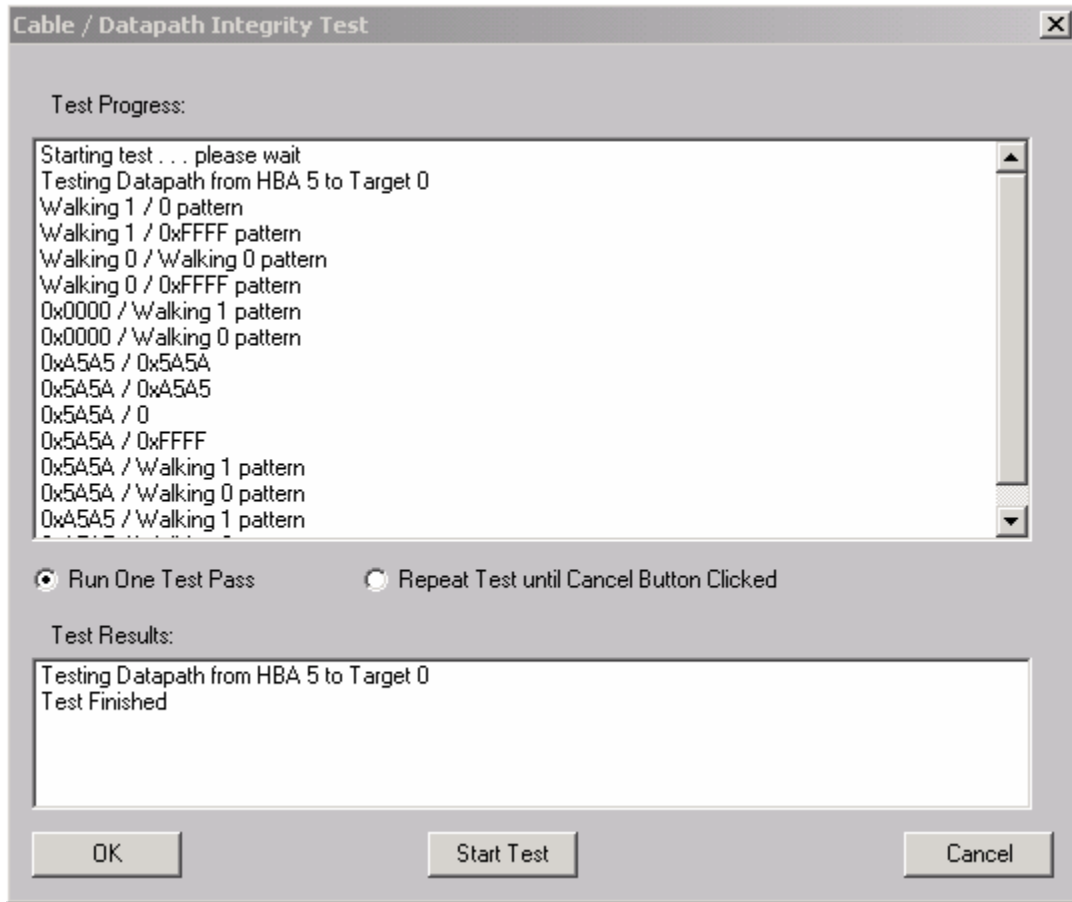
CDB Distribution: A pie chart showing the distribution of CDBs. The legend indicates Write (red), Read (green), and Other (blue).

Data: A pie chart showing the distribution of data. The legend indicates Data (red) and CMD (green).

Callout: For each test system keep a log of the read, write, and IO latency metrics collected while running the High Speed Data test.

If you notice a change in these numbers, the transfer rates dropping or the IO latency times increasing, thoroughly check and replace any worn cables or connectors.

On parallel bus systems be sure to also run the Cable Integrity test – a test designed to find crosstalk and termination issues on parallel SCSI buses



Use BAM to capture this test, and as before keep a log of the results

The screenshot displays the BAM by SCSI Toolbox, LLC software interface. The top section shows a table of CDBs (Control Data Blocks) with columns for Ctr, Device, Phase Type, CDB Desc, Data, Data Length, Delta, and Driver. The table contains 9 rows of data, including Data In, Write Buffer, Read Buffer, and Data Out phases. The bottom section shows performance monitors with a Summary Statistics panel, CDB Distribution pie charts, and a Data Rate graph. A yellow callout box points to the statistics, advising to keep a log of these numbers.

Ctr	Device	Phase Type	CDB Desc	Data	Data Length	Delta	Driver
889	5:0:0	Data In		A5 A5 E0 00 A5 A5 E0 00 A5 A5 E0 00 A5 A5 E0 00	65536 Bytes	1.4 ms	
890	5:0:0	CDB	Write Buffer	38 02 00 00 00 00 01 00 00 00	10 Bytes	985 us	stsclass
891	5:0:0	Data Out		A5 A5 C0 00 A5 A5 C0 00 A5 A5 C0 00 A5 A5 C0 00	65536 Bytes	1.5 ms	
892	5:0:0	CDB	Read Buffer	3C 02 00 00 00 00 01 00 00 00	10 Bytes	38 us	stsclass
893	5:0:0	Data In		A5 A5 C0 00 A5 A5 C0 00 A5 A5 C0 00 A5 A5 C0 00	65536 Bytes	1.4 ms	
894	5:0:0	CDB	Write Buffer	38 02 00 00 00 00 01 00 00 00	10 Bytes	1.0 ms	stsclass
895	5:0:0	Data Out		A5 A5 80 00 A5 A5 80 00 A5 A5 80 00 A5 A5 80 00	65536 Bytes	1.4 ms	
896	5:0:0	CDB	Read Buffer	3C 02 00 00 00 00 01 00 00 00	10 Bytes	38 us	stsclass
897	5:0:0	Data In		A5 A5 80 00 A5 A5 80 00 A5 A5 80 00 A5 A5 80 00	65536 Bytes	1.4 ms	

Summary Statistics:
Total CDBs: 449
W/R CDBs: 448 (R: 224, W: 224)
Data bytes (k): 28672 (R: 14336, W: 14336)
Capture Time: 0.92 Sec
I/Os per Sec: 488.85
Bus Utilization %: 99.78
Percentage of W/R CDBs: 99.78%
Read Transfer Rate - Avg: 45.38 High: 45.45
Read Transfer Size - avg: 65536.00
Write Transfer Rate - Avg: 44.59 High: 44.89
Write Transfer Size - avg: 65536.00
I/O Latency - Low: 37.00 Avg: 23.18 High: 162.00
Incomplete CDBs: 0
Maximum Queue Depth: 1

Graphs:
Data Rate (Write, Read)

As before, keep a log of these numbers - if there is a significant change over time be sure to check all cables, terminators, and connections

By simply setting up a regimen to run these tests periodically you can have a high level of confidence that your test system is solid and reliable.