Test Results for Disk Imaging Tools: dd Provided with FreeBSD 4.4
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Introduction

The Computer Forensics Tool Testing (CFTT) project is the joint effort of the National Institute of Justice, the National Institute of Standards and Technology (NIST), the U. S. Department of Defense, the Technical Support Working Group, and other related agencies. The objective of the CFTT project is to provide measurable assurance to practitioners, researchers, and other applicable users that the tools used in computer forensic investigations provide accurate results. Accomplishing this requires the development of specifications and test methods for computer forensic tools and subsequent testing of specific tools against those specifications.

The test results provide the information necessary for developers to improve tools, users to make informed choices, and the legal community and others to understand the tools’ capabilities. The use of well-recognized methodologies for conformance and quality testing serves as the foundation of our approach for testing computer forensic tools. Plus, in an effort to further develop the specifications and test methods, we encourage the entire forensics community to visit the CFTT Web site (http://www.cftt.nist.gov), where drafts are accessible for both commentary and review.

This document reports the results from testing one commonly used disk imaging tool, dd as provided with FreeBSD 4.4, against Disk Imaging Tool Specification, Version 3.1.6, developed by the CFTT staff and available at http://www.cftt.nist.gov/DI-spec-3-1-6.doc. This specification identifies the top-level disk imaging tool requirements as—

- The tool shall make a bit-stream duplicate or an image of an original disk or partition.
- The tool shall not alter the original disk.
- The tool shall log I/O errors.
- The tool’s documentation shall be correct.

Note: The test methodology is for software tools that copy or image hard disk drives. It does not cover analog media or digital media such as cell phones or personal digital assistants (PDAs).

Test results from other software packages and the CFTT test methodology can be found on NIJ’s Computer Forensic Tool Testing Web page, http://www.ojp.usdoj.gov/nij/sciencetech/cftt.htm.
Test Results for Disk Imaging Tools:  
**dd Provided with FreeBSD 4.4**

Tool Tested:  dd execution environment utility provided with FreeBSD 4.4  
Operating System:  FreeBSD 4.4-RELEASE #0 released 9/01  
Supplier:  FreeBSD Foundation  
Address:  7321 Brockway Drive  
Boulder, CO 80303  
Web:  [http://www.freebsd.org](http://www.freebsd.org)

1. **Results Summary by Requirements**

The tool shall make a bit-stream duplicate or an image of an original disk or partition. 
For all 32 test cases that were run, the dd utility produced an accurate bit-stream duplicate or an image on disks or partitions of all disk sectors copied.

The tool shall not alter the original disk. 
For all the test cases that were run, a SHA-1 hash was created on the source. Another SHA-1 hash was created on the source after the test case was run. In all cases, the hash codes matched (i.e., the source was not altered).

The tool shall be able to verify the integrity of a disk image file. 
This requirement does not apply to dd.

The tool shall log I/O errors. 
Assertions requiring read or write errors were not tested. The dd utility did produce a log message that there was no space left on the destination when the source was greater than the destination.

The tool documentation shall be correct. 
No errors were found in the documentation supplied.

2. **Anomalies**

No anomalies were observed.

3. **Test Case Selection**

The test cases were selected from the Linux test cases of *Disk Imaging Tool Specification, Version 3.1.6*. Although these test cases were developed for disk imaging tools running in the Linux environment, these cases are suitable for any UNIX-like environment such as FreeBSD.
Not all of the 52 test cases specified in *Disk Imaging Tool Specification, Version 3.1.6* apply to FreeBSD dd.

The primary criterion for selecting a test case is the existence of a tool feature that is covered by the objective of the test case as defined by the test case summary from *Disk Imaging Tool Specification, Version 3.1.6*. For example, test case DI(Linux)-1 calls for the following setup: *Copy a LINUX IDE source disk to a LINUX IDE destination disk where the source disk is smaller than the destination.* Since every parameter specified in the setup can be applied to dd, test case DI(Linux)-1 is used. However, for test case DI-17, detecting a corrupted image file, the test case is not used since dd does not detect whether an image file has been changed. In practice, this would be accomplished with a separate program such as md5sum.

### 3.1 Inapplicable Test Cases

Test cases that met the following criteria were designated as not applying to dd testing:

- Test cases that use a corrupted image file do not apply since this is not supported by dd.
- Test cases that require removable magnetic media such as tape were not run.

### 3.2 Selected Test Cases

The following 32 test cases were used to test dd in the FreeBSD environment. Each line of the table describes one test case. The **Case** column identifies the test case. The **Op** column indicates the type of operation, either to create a copy of the source or to create an image file. The **Src** column indicates the type of interface used to connect the source drive to the test PC. The **Dst** column indicates the type of interface used to connect the destination drive to the test PC. The **Rel Size** column indicates the relative size of the source drive to the destination drive. All test cases with the **Obj** parameter value of Disk are operations on the entire physical hard drive. All test cases with the **Obj** parameter value equal to a partition type (e.g., FAT16, etc.) are operations on a logical drive (a partition). The entries in the **Err** column indicate the type of error introduced for the test. However, this parameter was not used for the dd test cases.

<table>
<thead>
<tr>
<th>Case</th>
<th>Op</th>
<th>Src</th>
<th>Dst</th>
<th>Rel Size</th>
<th>Obj</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>copy</td>
<td>IDE</td>
<td>IDE</td>
<td>src &lt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>02</td>
<td>copy</td>
<td>IDE</td>
<td>IDE</td>
<td>src = dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>03</td>
<td>copy</td>
<td>IDE</td>
<td>IDE</td>
<td>src &gt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>04</td>
<td>copy</td>
<td>IDE</td>
<td>IDE</td>
<td>src &lt; dst</td>
<td>FAT16</td>
<td>none</td>
</tr>
<tr>
<td>05</td>
<td>copy</td>
<td>IDE</td>
<td>IDE</td>
<td>src = dst</td>
<td>FAT32</td>
<td>none</td>
</tr>
<tr>
<td>06</td>
<td>copy</td>
<td>IDE</td>
<td>IDE</td>
<td>src &gt; dst</td>
<td>LINUX</td>
<td>none</td>
</tr>
<tr>
<td>07</td>
<td>copy</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src &lt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>08</td>
<td>copy</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src = dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>09</td>
<td>copy</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src &gt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>10</td>
<td>copy</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src &lt; dst</td>
<td>NTFS</td>
<td>none</td>
</tr>
<tr>
<td>11</td>
<td>copy</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src = dst</td>
<td>FAT32</td>
<td>none</td>
</tr>
<tr>
<td>12</td>
<td>copy</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src &gt; dst</td>
<td>FAT16</td>
<td>none</td>
</tr>
<tr>
<td>13</td>
<td>copy</td>
<td>IDE</td>
<td>SCI</td>
<td>src &lt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>14</td>
<td>copy</td>
<td>IDE</td>
<td>SCI</td>
<td>src &gt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>15</td>
<td>copy</td>
<td>SCI</td>
<td>IDE</td>
<td>src &lt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
</tbody>
</table>
### 4. Test Results by Assertion

This section presents the results of dd testing with results grouped by assertion. The assertions are taken from *Disk Imaging Tool Specification, Version 3.1.6.*

#### 4.1 Mandatory Assertions

**AM-1. If a source is accessed by the tool, then the source will not be altered.**

After each source disk is created, a SHA-1 hash value is calculated and saved. Each time the tool is run, another SHA-1 hash is calculated after the run and compared to the saved value. For all test cases that were run, the hash codes matched (i.e., the source was not altered).

The column labeled **Case** is the test case ID. **Before SHA-1** is the first four and last four digits (in hexadecimal) of the SHA computed on the source disk before running any test cases. **After SHA-1** is the first four and last four digits (in hexadecimal) of the SHA computed on the source disk after executing dd for the given test case. The **SHA Values Match?** column indicates if the full hash values match.

<table>
<thead>
<tr>
<th>Case</th>
<th>Before SHA-1</th>
<th>After SHA-1</th>
<th>SHA Values Match?</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>8034 ... B235</td>
<td>8034 ... B235</td>
<td>OK</td>
</tr>
<tr>
<td>02</td>
<td>83A0 ... 2A54</td>
<td>83A0 ... 2A54</td>
<td>OK</td>
</tr>
<tr>
<td>03</td>
<td>83A0 ... 2A54</td>
<td>83A0 ... 2A54</td>
<td>OK</td>
</tr>
<tr>
<td>04</td>
<td>83A0 ... 2A54</td>
<td>83A0 ... 2A54</td>
<td>OK</td>
</tr>
<tr>
<td>05</td>
<td>3DE5 ... FD14</td>
<td>3DE5 ... FD14</td>
<td>OK</td>
</tr>
<tr>
<td>06</td>
<td>83A0 ... 2A54</td>
<td>83A0 ... 2A54</td>
<td>OK</td>
</tr>
<tr>
<td>07</td>
<td>25BF ... 9CBF</td>
<td>25BF ... 9CBF</td>
<td>OK</td>
</tr>
<tr>
<td>08</td>
<td>25BF ... 9CBF</td>
<td>25BF ... 9CBF</td>
<td>OK</td>
</tr>
<tr>
<td>09</td>
<td>0F9D ... 7AB0</td>
<td>0F9D ... 7AB0</td>
<td>OK</td>
</tr>
<tr>
<td>10</td>
<td>5957 ... 1B8D</td>
<td>5957 ... 1B8D</td>
<td>OK</td>
</tr>
<tr>
<td>11</td>
<td>D6AD ... D34D</td>
<td>D6AD ... D34D</td>
<td>OK</td>
</tr>
</tbody>
</table>
AM-2. If there are no errors reading from a source or writing to a destination, then a bit-stream duplicate of the source will be created on the destination.

The column labeled **Case** is the test case ID. The type of object copied (disk or partition) is indicated in the **Obj** column. The column labeled **Src** is the number of sectors on the source to be copied. The column labeled **Dst** is the number of sectors on the destination. The numbers of sectors compared are listed in the **Compared** column. The column **Not Matched** indicates the number of sectors that were expected to compare equal but were different.

<table>
<thead>
<tr>
<th>Case</th>
<th>Obj</th>
<th>Src</th>
<th>Dst</th>
<th>Compared</th>
<th>Not Matched</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Disk</td>
<td>40188960</td>
<td>58633344</td>
<td>40188960</td>
<td>0</td>
</tr>
<tr>
<td>02</td>
<td>Disk</td>
<td>40188960</td>
<td>40188960</td>
<td>40188960</td>
<td>0</td>
</tr>
<tr>
<td>03</td>
<td>Disk</td>
<td>40188960</td>
<td>12594960</td>
<td>12594960</td>
<td>0</td>
</tr>
<tr>
<td>04</td>
<td>FAT16</td>
<td>1236942</td>
<td>1333332</td>
<td>1236942</td>
<td>0</td>
</tr>
<tr>
<td>05</td>
<td>FAT32</td>
<td>1236942</td>
<td>1236942</td>
<td>1236942</td>
<td>0</td>
</tr>
<tr>
<td>06</td>
<td>LINUX</td>
<td>6152895</td>
<td>5944050</td>
<td>5944050</td>
<td>0</td>
</tr>
<tr>
<td>07</td>
<td>Disk</td>
<td>17938985</td>
<td>35843670</td>
<td>17938985</td>
<td>0</td>
</tr>
<tr>
<td>08</td>
<td>Disk</td>
<td>17938985</td>
<td>17938985</td>
<td>17938985</td>
<td>0</td>
</tr>
<tr>
<td>09</td>
<td>Disk</td>
<td>17938985</td>
<td>17921835</td>
<td>17921835</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>NTFS</td>
<td>1236942</td>
<td>1333332</td>
<td>1236942</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>FAT32</td>
<td>1236942</td>
<td>1236942</td>
<td>1236942</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>FAT16</td>
<td>1236942</td>
<td>1140552</td>
<td>1140552</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>Disk</td>
<td>40188960</td>
<td>71687370</td>
<td>40188960</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>Disk</td>
<td>39102336</td>
<td>35885448</td>
<td>35885448</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>Disk</td>
<td>17938985</td>
<td>40188960</td>
<td>17938985</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>Disk</td>
<td>17938985</td>
<td>12594960</td>
<td>12594960</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>Disk</td>
<td>40188960</td>
<td>58633344</td>
<td>40188960</td>
<td>0</td>
</tr>
<tr>
<td>18</td>
<td>Disk</td>
<td>40188960</td>
<td>40188960</td>
<td>40188960</td>
<td>0</td>
</tr>
<tr>
<td>19</td>
<td>Disk</td>
<td>40188960</td>
<td>39102336</td>
<td>39102336</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>LINUX</td>
<td>6152895</td>
<td>6361740</td>
<td>6152895</td>
<td>0</td>
</tr>
<tr>
<td>21</td>
<td>FAT32</td>
<td>1236942</td>
<td>1236942</td>
<td>1236942</td>
<td>0</td>
</tr>
<tr>
<td>22</td>
<td>FAT32</td>
<td>1236942</td>
<td>1140552</td>
<td>1140552</td>
<td>0</td>
</tr>
</tbody>
</table>

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AM-3. If there are errors reading from a source or writing to a destination, then a qualified bit-stream duplicate of the source will be created on the destination. The identified areas are replaced by values specified by the tool’s documentation.

This assertion was not tested.

AM-4. If there are errors reading from the source or writing to the destination, then the error types and locations are logged.

This assertion was not tested.

AM-5. If the source or destination is an IDE or SCSI drive and an image or bit-stream duplicate is created, then the interface used is presumed to be well defined.\(^1\)

See all test cases.

AM-6. If the expected result of any test defined in this specification is achieved and the documentation was followed without change in achieving this result, then the documentation is presumed correct.

No errors were observed in the documentation of `dd` obtained from the manual (man) entry.

AM-7. If a bit-stream duplicate of a source is created on a larger destination, then the contents of areas on the destination that are not part of the duplicate are set to values as specified in the tool documentation.

The column labeled **Case** is the test case ID. The type of object copied is indicated in the **Obj** column. The **Do BF** column indicates that `dd` should never backfill. The **Excess** column indicates the number of excess sectors on the destination. The number of excess sectors backfilled with a user-specified value is indicated in the **BF** column. The number of excess destination sectors that were not changed by `dd` is indicated in the **Not BF** column. The values in the **BF** and **Not BF** columns do not apply for cases 10, 23, and 38 because NTFS and Linux partitions, unlike FAT partitions, have formatting information in the excess sectors. Consequently, the values in the **BF** and **Not BF** columns for these three test cases should be ignored. Cases 10, 23, and 38 require extra steps to verify that the excess sectors are not changed by the `dd` command.

---

1 The actual assertion from the specification refers to a specific requirement from the spec. The essence of the referenced requirement is for the interface to be well defined.
When a FAT partition is formatted, the sectors in the lower addresses are modified to contain the FAT table and other information. The sectors in the high addresses are not changed and retain any content from before the partition is formatted. Therefore, the content of the excess sectors can be reliably known. However, NTFS and Linux ext2 partitions have control information (e.g., inodes) scattered throughout the partition. Therefore, to verify that the excess sectors are undisturbed by dd, a hash of the excess sectors is computed before and after running dd. The before hash for each case appears in Table 4-1. The after hash appears in Table 4-2. If the excess sectors are unchanged, then the hash values are the same.

Table 4-1. SHA-1 Hash of Excess Sectors Before dd

<table>
<thead>
<tr>
<th>Case</th>
<th>Excess Sector Area Hash</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>DA90E58BF899C870F385368BD1544A3E7D4D75BC</td>
</tr>
<tr>
<td>23</td>
<td>85D571DAC5834ED608724FACFC5865AA5512663F</td>
</tr>
<tr>
<td>38</td>
<td>31C2BD77EE38AC8395F8CC11FB0D337B4A213B04</td>
</tr>
</tbody>
</table>

Table 4-2. SHA-1 Hash of Excess Sectors After dd

<table>
<thead>
<tr>
<th>Case</th>
<th>Excess Sector Area Hash</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>DA90E58BF899C870F385368BD1544A3E7D4D75BC</td>
</tr>
<tr>
<td>23</td>
<td>85D571DAC5834ED608724FACFC5865AA5512663F</td>
</tr>
<tr>
<td>38</td>
<td>31C2BD77EE38AC8395F8CC11FB0D337B4A213B04</td>
</tr>
</tbody>
</table>

AM-8. If a bit-stream duplicate of a source is created on a smaller destination, then the duplicate is qualified by omitted portions of the bit-stream, and the tool will notify the user that the source is larger than the destination.

The column labeled Case is the test case ID. The column labeled Op indicates the type of operation selected. The type of object copied is indicated in the Obj column. The message from a pop-up message box is in the Message column.
### 4.2 Optional Assertions

**AO-1.** If a hash of one or more blocks (i.e., less than the entire disk) from the source is computed before duplication and is compared to a hash of the same blocks from the destination, the hashes will compare equal.

This assertion was not tested.

**AO-2.** If more than one partition exists on the source disk, the tool will produce a duplicate of any user-selected source partition on the destination.

See the results for the following test cases. Each line of the table describes one test case. The **Case** column identifies the test case. The **Op** column indicates the type of operation, either to create a copy of the source or to create and image file. The **Src** column indicates the type of interface used to connect the source drive to the test PC. The **Dst** column indicates the type of interface used to connect the destination drive to the test PC. The **Rel Size** column indicates the relative size of the source drive to the destination drive. All test cases with the **Obj** parameter value of **Disk** are operations on the entire physical hard drive. All test cases with the **Obj** parameter value equal to a partition type (e.g., FAT16, etc.) are operations on a logical drive (a partition). The entries in the **Err** column indicate the type of error introduced for the test. However, this parameter was not used for the dd test cases.

<table>
<thead>
<tr>
<th>Case</th>
<th>Op</th>
<th>Src</th>
<th>Dst</th>
<th>Rel Size</th>
<th>Obj</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>copy</td>
<td>IDE</td>
<td>IDE</td>
<td>src &lt; dst</td>
<td>FAT16</td>
<td>none</td>
</tr>
<tr>
<td>05</td>
<td>copy</td>
<td>IDE</td>
<td>IDE</td>
<td>src = dst</td>
<td>FAT32</td>
<td>none</td>
</tr>
<tr>
<td>06</td>
<td>copy</td>
<td>IDE</td>
<td>IDE</td>
<td>src &gt; dst</td>
<td>LINUX</td>
<td>none</td>
</tr>
<tr>
<td>10</td>
<td>copy</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src &lt; dst</td>
<td>NTFS</td>
<td>none</td>
</tr>
<tr>
<td>11</td>
<td>copy</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src = dst</td>
<td>FAT32</td>
<td>none</td>
</tr>
<tr>
<td>12</td>
<td>copy</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src &gt; dst</td>
<td>FAT16</td>
<td>none</td>
</tr>
<tr>
<td>23</td>
<td>image</td>
<td>IDE</td>
<td>IDE</td>
<td>src &lt; dst</td>
<td>LINUX</td>
<td>none</td>
</tr>
<tr>
<td>27</td>
<td>image</td>
<td>IDE</td>
<td>IDE</td>
<td>src = dst</td>
<td>FAT32</td>
<td>none</td>
</tr>
<tr>
<td>30</td>
<td>image</td>
<td>IDE</td>
<td>IDE</td>
<td>src &gt; dst</td>
<td>FAT32</td>
<td>none</td>
</tr>
<tr>
<td>38</td>
<td>image</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src &lt; dst</td>
<td>NTFS</td>
<td>none</td>
</tr>
<tr>
<td>42</td>
<td>image</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src = dst</td>
<td>LINUX</td>
<td>none</td>
</tr>
<tr>
<td>45</td>
<td>image</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src &gt; dst</td>
<td>FAT16</td>
<td>none</td>
</tr>
</tbody>
</table>

**AO-3.** If a partition exists on the source, the tool will display or log a message indicating that the partition exists and display or log one or more items of information from the following list: drive indicator, device type, device address or mount point, size, space used, and free space.

This product does not provide the functionality described.
AO-4. If the tool logs the tool version, it will be the version referred to in the implementation’s documentation.

This product does not provide the functionality described.

AO-5. If the subject disk identification is available and the tool is capable of logging the subject disk identification, then the subject disk identification will be logged.

This product does not provide the functionality described.

AO-6. If the tool logs the source partition table in human readable form and the information from the source partition table can be ascertained independently from the tool, then the source partition table information will accurately match the content of the independent partition table information.

This product does not provide the functionality described.

AO-7. If the tool logs errors and any error occurs, then the type and location of the error will be logged.

This assertion was not tested.

AO-8. If the tool logs tool actions and the tool’s documentation states what actions are logged, then the actions logged will accurately match those documented in the tool’s documentation.

This product does not provide the functionality described.

AO-9. If the tool logs start and finish run times, then the logged start and finish run times will accurately match those recorded by the tester according to screen input images, test input scripts, or tester notes.

This product does not provide the functionality described.

AO-10. If the tool logs tool settings and the tool’s documentation states what settings are logged, then the logged settings will accurately match those set by the tester or as documented in the tool’s documentation.

This product does not provide the functionality described.

AO-11. If the tool logs user comments, then the logged user comments will accurately match those entered by the tester as captured in screen input images, test input scripts, or tester notes.

This product does not provide the functionality described.
AO-12. If the tool creates image files, then it will create an image file of a source on a magnetic medium that can be removed from the platform on which it was created.

Suitable magnetic tape removable media were not available. Small (less than 250MB) media, such as floppy disks or zip disks, were not considered useful for imaging hard drives and therefore, were not tested.

AO-13. If the tool creates an image file from a source on a removable magnetic medium, then a duplicate of the source created from the removable magnetic medium will result in a duplicate on the destination, and the destination will compare equal to the source.

Suitable magnetic tape removable media were not available. Small (less than 250MB) media, such as floppy disks or zip disks, were not considered useful for imaging hard drives and therefore, were not tested.

AO-14. If an image file is created, and there are no errors reading from a source, nor errors writing to a destination, then a bit-stream duplicate created from the image file will compare equal to the source.

The results for image files are included in the results for the mandatory assertions. The following test cases are for image files. Each line of the table describes one test case. The Case column identifies the test case. The Op column indicates the type of operation, either to create a copy of the source or to create and image file. The Src column indicates the type of interface used to connect the source drive to the test PC. The Dst column indicates the type of interface used to connect the destination drive to the test PC. The Rel Size column indicates the relative size of the source drive to the destination drive. All test cases with the Obj parameter value of Disk are operations on the entire physical hard drive. All test cases with the Obj parameter value equal to a partition type (e.g., FAT16, etc.) are operations on a logical drive (a partition). The entries in the Err column indicate the type of error introduced for the test. However, this parameter was not used for the dd test cases.

<table>
<thead>
<tr>
<th>Case</th>
<th>Op</th>
<th>Src</th>
<th>Dst</th>
<th>Rel Size</th>
<th>Obj</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>image</td>
<td>IDE</td>
<td>IDE</td>
<td>src &lt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>20</td>
<td>image</td>
<td>IDE</td>
<td>IDE</td>
<td>src = dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>21</td>
<td>image</td>
<td>IDE</td>
<td>IDE</td>
<td>src &gt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>23</td>
<td>image</td>
<td>IDE</td>
<td>IDE</td>
<td>src &lt; dst</td>
<td>LINUX</td>
<td>none</td>
</tr>
<tr>
<td>27</td>
<td>image</td>
<td>IDE</td>
<td>IDE</td>
<td>src = dst</td>
<td>FAT32</td>
<td>none</td>
</tr>
<tr>
<td>30</td>
<td>image</td>
<td>IDE</td>
<td>IDE</td>
<td>src &gt; dst</td>
<td>FAT32</td>
<td>none</td>
</tr>
<tr>
<td>33</td>
<td>image</td>
<td>IDE</td>
<td>SCSI</td>
<td>src &lt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>35</td>
<td>image</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src = dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>36</td>
<td>image</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src &gt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>38</td>
<td>image</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src &lt; dst</td>
<td>NTFS</td>
<td>none</td>
</tr>
<tr>
<td>42</td>
<td>image</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src = dst</td>
<td>LINUX</td>
<td>none</td>
</tr>
<tr>
<td>45</td>
<td>image</td>
<td>SCSI</td>
<td>SCSI</td>
<td>src &gt; dst</td>
<td>FAT16</td>
<td>none</td>
</tr>
<tr>
<td>48</td>
<td>image</td>
<td>IDE</td>
<td>SCSI</td>
<td>src &lt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>49</td>
<td>image</td>
<td>IDE</td>
<td>SCSI</td>
<td>src &gt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>51</td>
<td>image</td>
<td>SCSI</td>
<td>IDE</td>
<td>src &lt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
<tr>
<td>52</td>
<td>image</td>
<td>SCSI</td>
<td>IDE</td>
<td>src &gt; dst</td>
<td>Disk</td>
<td>none</td>
</tr>
</tbody>
</table>
5. Testing Environment

The tests were run in the NIST CFTT lab. This section describes the hardware (test computers and hard drives) available for testing. Not all components were used in testing. The following host computers were available for execution of test cases: Paladin, HecRamsey, McCloud, McMillan, AndWife, Cadfael, Rumpole, Wimsey, and JudgeDee. More than 25 hard drives (13 different models and 6 different brands) were used for the tests (Table 5-1). The tests were run with hard drives arranged in one of several possible configurations (Table 5-4), as required by the test parameters.

5.1 Extended BIOS Host Computers

Cadfael, Rumpole, Wimsey, and JudgeDee have the following hardware components in common:

Table 5-1. Extended BIOS Host Computer Hardware Components

<table>
<thead>
<tr>
<th>ASUS CUSL2 Motherboard</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS: Award Medallion v6.0</td>
</tr>
<tr>
<td>Intel Pentium III (Coppermine) 933Mhz</td>
</tr>
<tr>
<td>512,672k Memory</td>
</tr>
<tr>
<td>Adaptec 29160N SCSI Adapter card</td>
</tr>
<tr>
<td>Plextor CR-RW PX-W124TS Rev: 1.06</td>
</tr>
<tr>
<td>Iomega 2GB Jaz drive Rev: E.17</td>
</tr>
<tr>
<td>LS-120 Super floppy</td>
</tr>
<tr>
<td>Two slots for removable IDE hard disk drives</td>
</tr>
<tr>
<td>Two slots for removable SCSI hard disk drive</td>
</tr>
</tbody>
</table>

Rumpole also had a 30GB OnStream SC30 tape drive (not used in the test procedures). JudgeDee had a third slot for a removable IDE hard disk drive.

Paladin, HecRamsey, McCloud, McMillan, and AndWife have the following hardware components in common:

Table 5-2. Alternate Extended BIOS Host Computer Hardware Components

<table>
<thead>
<tr>
<th>Intel D845WNL Motherboard</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS: HV84510A.86A.0022.P05</td>
</tr>
<tr>
<td>Intel Pentium IV 2.0Ghz</td>
</tr>
<tr>
<td>512,672k Memory</td>
</tr>
<tr>
<td>Adaptec 29160 SCSI Adapter card</td>
</tr>
<tr>
<td>Tekram DC-390U3W SCSI Adapter card</td>
</tr>
<tr>
<td>Plextor CR-RW PX-W124TS Rev: 1.06</td>
</tr>
<tr>
<td>LG 52X CD–ROM</td>
</tr>
<tr>
<td>Floppy drive</td>
</tr>
<tr>
<td>Three slots for removable IDE hard disk drives</td>
</tr>
<tr>
<td>Two slots for removable SCSI hard disk drive</td>
</tr>
</tbody>
</table>
5.2 Hard Disk Drives

The hard disk drives that were used were selected from the drives listed in Table 5-3. These hard drives were mounted in removable storage modules. Any combination of two IDE hard drives and two SCSI hard drives can be installed in Paladin, HecRamsey, McCloud, McMillan, AndWife, Cadfael, Rumpole, Wimsey, or JudgeDee as required for a test. The legacy BIOS computers can have only two IDE drives mounted at a time.

The IDE disks used in the legacy BIOS computers have jumpers set manually to drive 0 for source drives and drive 1 for destination drives, and the media drive is set to either 0 or 1 depending on the drive slot available after either the source or destination drive is installed. The IDE disks used in Paladin, HecRamsey, McCloud, McMillan, AndWife, Cadfael, Rumpole, Wimsey, and JudgeDee have jumpers set for cable select.

The SCSI ID for the SCSI disk is set to either 0 or 1 as required by the test case. Except as noted, a source disk is set to ID 0, and a destination disk is set to ID 1.

Table 5-3. Hard Drives Available for Use in Testing

<table>
<thead>
<tr>
<th>Label</th>
<th>Model</th>
<th>Interface</th>
<th>Usable Sectors</th>
<th>Capacity (GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>FUJITSU_MAN3184MC</td>
<td>SCSI</td>
<td>35885447</td>
<td>18.37</td>
</tr>
<tr>
<td>20</td>
<td>SEAGATE_ST373405LC</td>
<td>SCSI</td>
<td>143374740</td>
<td>43.40</td>
</tr>
<tr>
<td>31</td>
<td>FUJITSU_MAG3091L SUN9.0G</td>
<td>SCSI</td>
<td>17689266</td>
<td>9.06</td>
</tr>
<tr>
<td>32</td>
<td>FUJITSU_MAG3091L SUN9.0G</td>
<td>SCSI</td>
<td>17689266</td>
<td>9.06</td>
</tr>
<tr>
<td>34</td>
<td>FUJITSU_MAG3091L SUN9.0G</td>
<td>SCSI</td>
<td>17689266</td>
<td>9.06</td>
</tr>
<tr>
<td>1F</td>
<td>QUANTUM_ATLAS10K3_18_SCA</td>
<td>SCSI</td>
<td>35916547</td>
<td>18.38</td>
</tr>
<tr>
<td>62</td>
<td>WCWCD64AA</td>
<td>IDE</td>
<td>12594960</td>
<td>6.44</td>
</tr>
<tr>
<td>63</td>
<td>WCWCD64AA</td>
<td>IDE</td>
<td>12594960</td>
<td>6.44</td>
</tr>
<tr>
<td>64</td>
<td>WCWCD64AA</td>
<td>IDE</td>
<td>12594960</td>
<td>6.44</td>
</tr>
<tr>
<td>71</td>
<td>IC35L040AVER07-0</td>
<td>IDE</td>
<td>80418240</td>
<td>41.17</td>
</tr>
<tr>
<td>7A</td>
<td>MAXTOR_6L040J2</td>
<td>IDE</td>
<td>78177792</td>
<td>40.02</td>
</tr>
<tr>
<td>90</td>
<td>WDC_WD300BB-00CAA0</td>
<td>IDE</td>
<td>58633344</td>
<td>30.02</td>
</tr>
<tr>
<td>92</td>
<td>WDC_WD300BB-00CAA0</td>
<td>IDE</td>
<td>58633344</td>
<td>30.02</td>
</tr>
<tr>
<td>93</td>
<td>WDC_WD300BB-00CAA0</td>
<td>IDE</td>
<td>58633344</td>
<td>30.02</td>
</tr>
<tr>
<td>9E</td>
<td>WDC_WD200BB-32FCFO</td>
<td>IDE</td>
<td>39102336</td>
<td>20.02</td>
</tr>
<tr>
<td>A5</td>
<td>WDC_WD200BB-00UA1</td>
<td>IDE</td>
<td>39102336</td>
<td>20.02</td>
</tr>
<tr>
<td>A7</td>
<td>WDC_WD200BB-00UA1</td>
<td>IDE</td>
<td>39102336</td>
<td>20.02</td>
</tr>
<tr>
<td>A8</td>
<td>WDC_WD200BB-00UA1</td>
<td>IDE</td>
<td>39102336</td>
<td>20.02</td>
</tr>
<tr>
<td>CC</td>
<td>SEAGATE_ST336705LC</td>
<td>SCSI</td>
<td>71687370</td>
<td>36.70</td>
</tr>
<tr>
<td>E2</td>
<td>QUANTUM_ATLAS10K2-TY092J</td>
<td>SCSI</td>
<td>17938985</td>
<td>9.18</td>
</tr>
<tr>
<td>E3</td>
<td>QUANTUM_ATLAS10K2-TY092J</td>
<td>SCSI</td>
<td>17938985</td>
<td>9.18</td>
</tr>
<tr>
<td>E4</td>
<td>QUANTUM_ATLAS10K2-TY092J</td>
<td>SCSI</td>
<td>17938985</td>
<td>9.18</td>
</tr>
<tr>
<td>E6</td>
<td>SEAGATE_ST318404LC</td>
<td>SCSI</td>
<td>35843670</td>
<td>18.35</td>
</tr>
<tr>
<td>E7</td>
<td>SEAGATE_ST318404LC</td>
<td>SCSI</td>
<td>35843670</td>
<td>18.35</td>
</tr>
<tr>
<td>EB</td>
<td>SEAGATE_ST39204LC</td>
<td>SCSI</td>
<td>17921835</td>
<td>9.17</td>
</tr>
<tr>
<td>F5</td>
<td>IBM-DTLA-307020</td>
<td>IDE</td>
<td>40188960</td>
<td>20.57</td>
</tr>
<tr>
<td>F6</td>
<td>IBM-DTLA-307020</td>
<td>IDE</td>
<td>40188960</td>
<td>20.57</td>
</tr>
<tr>
<td>F7</td>
<td>IBM-DTLA-307020</td>
<td>IDE</td>
<td>40188960</td>
<td>20.57</td>
</tr>
</tbody>
</table>
5.3 Test Configurations

The host computer and hard drive setup were determined by the test case parameters. Two or three disk drives were required for each test case. Source, destination, and media disks were required for all test cases. The source disk provides something to copy. The destination disk provides a place to put the copy. The media disk provides a place to put the image file for test cases that require the creation of an image file. The media disk also provides the runtime FreeBSD environment for running dd. A DOS Boot floppy was used to create the runtime environment for the test case; it contained control scripts and log files. A CD–ROM contained the support and utility software. The support software provided for setup of test data, measurement of test results, and control of the test process.

For all the dd tests, one of the following extended BIOS computers were selected: Paladin, HecRamsey, McCloud, McMillan, AndWife, Cadfael, Rumpole, Wimsey, or JudgeDee. None of the Nexar computers were used.

The source disk interface and type of source partition determined the source disk selection. A disk was selected with the matching interface that contained a partition of the type required for the test case. The destination interface and the relative size parameters determined the selection of the destination drive. A drive was selected with the specified interface and, for whole-disk operations, size relative to the source. For partition operations, the actual size of the destination drive did not matter because the size of the partition on the destination was relevant. After the source and destination drives were selected, the media disk was selected for one of the two available drive slots.

The 12 system hard drive configurations used for the tests are presented in Table 5-4. The Step column indicates the phase of the test to which the configuration applies. The Source column indicates where the source drive was mounted. The drive was usually positioned as primary drive 1. SCSI source drives were set to SCSI ID 0. The Destination column indicates the positioning of the destination drive. The Media column indicates the positioning of the media drive.

<table>
<thead>
<tr>
<th>ID</th>
<th>Step</th>
<th>Source</th>
<th>Destination</th>
<th>Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>wipe</td>
<td>IDE secondary 1</td>
<td>IDE primary 0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>wipe</td>
<td>SCSI ID 1</td>
<td>IDE primary 0</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>dd</td>
<td>IDE primary 1</td>
<td>IDE secondary 1</td>
<td>IDE primary 0</td>
</tr>
<tr>
<td>4</td>
<td>dd</td>
<td>SCSI ID 0</td>
<td>SCSI ID 1</td>
<td>IDE primary 0</td>
</tr>
<tr>
<td>5</td>
<td>dd</td>
<td>SCSI ID 0</td>
<td>IDE secondary 1</td>
<td>IDE primary 0</td>
</tr>
<tr>
<td>6</td>
<td>dd</td>
<td>IDE primary 1</td>
<td>SCSI ID 1</td>
<td>IDE primary 0</td>
</tr>
<tr>
<td>7</td>
<td>compare</td>
<td>IDE primary 0</td>
<td>IDE secondary 1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>compare</td>
<td>IDE primary 0</td>
<td>SCSI ID 1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>compare</td>
<td>SCSI ID 0</td>
<td>IDE secondary 1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>compare</td>
<td>SCSI ID 0</td>
<td>SCSI ID 1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>hash</td>
<td>IDE primary 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>hash</td>
<td>SCSI ID 0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.4 Support Software

FS-TST Release 1.0 was developed to support the testing of disk imaging tools. FS-TST Release 1.0 can be obtained from http://www.cftt.nist.gov. The support software serves five main functions: initialization of a disk to a known value (DISKWIPE), comparison of a source with a destination (DISKCMP, PARTCMP, ADJCMP, and SECCMP), detection of changes to a disk (DISKHASH and SECHASH), corruption of an image file (CORRUPT), and simulation of a faulty disk [BADDISK and BADX13]. All programs (except for BADDISK and BADX13) were written in ANSI C and compiled with the Borland C++ compiler version 4.5. BADDISK and BADX13 were written in assembler language and compiled with Borland Turbo Assembler version 5.0.

5.5 Basic Structure of Test Cases

A test case has five parts: setup, execution of the tool to acquire an image, execution of the tool to add the image to the case file, execution of the tool to restore the image to a destination drive, and measurement of the results. The setup for the test case was done in the DOS environment and involved the following steps:

1. Initialize a source disk to a known value.
2. Hash the source disk and save the hash value.
3. Initialize a destination disk to a known value.
4. If the test requires a partition on the destination, then create and format a partition on the destination disk. If the test uses a destination partition larger than the source partition and the partition type is either NTFS or Linux, then compute a reference hash of the excess sectors of the destination partition.
5. If the test uses an image file, partition and format a media disk and load FreeBSD to the media disk.

Note that steps 1, 2, and 5 are performed once and then used for several test cases.

The tool execution was done in the FreeBSD environment. The steps in this execution phase were:

1. If an image file is required, use the tool to create an image file of the source on the media disk.
2. Use the tool to create the destination disk by either restoring an image file of the source to the destination or copying the source to the destination.

Measurement of the test results had four steps:

1. Compute a hash of the source disk and compare the computed hash value to the saved hash value. If the hashes are the same, then the tool has not altered the source disk.
2. Compare the source to the destination to determine what sectors match and the disposition of any excess destination sectors.
3. Examine the tool log file for any expected messages. For example, if the destination is too small, then there should be a message indicating the condition.
4. If the test uses a destination partition larger than the source partition and the partition type is either NTFS or Linux, then compute a hash of the excess sectors of the destination partition. If this hash agrees with the reference hash of the excess sectors, then the excess sectors are unchanged by dd.

6. **Test Results Summary Key**

A summary of the actual test results is presented in this report. The following table presents a description of each section of the test results summary.

<table>
<thead>
<tr>
<th>Heading</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Line</td>
<td>Test case ID and name and version of software tested.</td>
</tr>
<tr>
<td>Case Summary:</td>
<td>Test case summary from <em>Disk Imaging Tool Specification, Version 3.1.6.</em></td>
</tr>
<tr>
<td>Tester Name:</td>
<td>Name or initials of person executing test procedure.</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Time and date that test was started.</td>
</tr>
<tr>
<td>PC:</td>
<td>Name of computer where tool under test was executed.</td>
</tr>
<tr>
<td>Disks:</td>
<td>Description of the hard disks used in the test as the source, destination, and media. The BIOS assigned drive number is in hexadecimal.</td>
</tr>
<tr>
<td>Source disk setup:</td>
<td>Documentation of the creation of the source disk including the disk label, the computer used for setup, the person creating the source, time and date, the partitions and operating systems installed, the diskwipe command, and SHA-1 hash after the hard drive is configured.</td>
</tr>
<tr>
<td>Destination Setup:</td>
<td>Documentation of the creation of the destination disk including the diskwipe command. For corrupt image test cases, a destination is not required.</td>
</tr>
<tr>
<td>Execute:</td>
<td>Documentation of each command executed during the test.</td>
</tr>
<tr>
<td>Log files &amp; location:</td>
<td>Name and location of the log files in the test file archive.</td>
</tr>
<tr>
<td>Log File Highlights:</td>
<td>Selected entries from three of the test case log files:</td>
</tr>
<tr>
<td></td>
<td>• dd stderr output file.</td>
</tr>
<tr>
<td></td>
<td>• Comparison of source and destination.</td>
</tr>
<tr>
<td></td>
<td>• For partition cases, the source and destination partition tables.</td>
</tr>
<tr>
<td></td>
<td>• SHA-1 hash of the source drive after the test.</td>
</tr>
<tr>
<td>Expected Results:</td>
<td>Expected results listed in <em>Disk Imaging Tool Specification, Version 3.1.6.</em></td>
</tr>
<tr>
<td>Actual Results:</td>
<td>List of any anomalies observed.</td>
</tr>
<tr>
<td>Analysis:</td>
<td>Whether or not the expected results were achieved.</td>
</tr>
</tbody>
</table>

7. **Interpretation of Test Results**

There are six main questions of interest when examining the results of a test case:

- Is the source disk unchanged?
- Have the correct number of sectors been accurately copied?
- Has the tool alerted the user to a destination smaller than the source?
- Has the tool handled excess destination sectors correctly as specified?
- Has the tool detected changes to an image file?
- Has the tool alerted the user to any I/O errors?
7.1 Source Disk

The integrity of the source disk is checked by comparing the hash of the source disk computed before any tests are run with the hash computed after the tool is used. If the two hash values differ, then the tool has changed the source disk. The reference hash is recorded in the Source disk setup box, and the hash computed after the tool is run is recorded in the Log file highlights box.

7.2 Number of Sectors Copied

The number of sectors that should be copied is the minimum of the number of source sectors and the number of destination sectors. This value can be found on the sectors compared line of the Log file highlights box. If the next line of the Log file highlights box, sectors differ, is not zero, then the tool did not correctly copy all the sectors that should have been copied. The logical block addresses of the first few sectors not copied correctly are listed on the diffs range line.

The number of sectors in the source and destination can be determined as follows: If the tool operated on an entire disk, then the size of the source and destination can be found in the Disks box. If the tool operated on a single partition, then the partition sizes are presented in the partition tables in the Log file highlights box. The partitions used in the test are identified in the /select option parameters to the PARTCMP program execution presented in the Execute box. The /select option is followed by two parameters: the partition numbers of the source and destination partitions.

7.3 Small Destination Detection

The tool should issue a message indicating that the destination is smaller than the source for any test case defined for a smaller destination. The message is captured from the stderr file produced by dd and is reproduced in the Log file highlights box.

7.4 Excess Sectors

For disk operations, the tool should leave the contents of excess sectors as is. The tool action can be verified by the entries labeled Zero fill, Other fill, and Dst byte fill, giving the count of sectors in each category. The number of excess sectors is indicated in the Log file highlights box by the line with the text “… Source (...) has [number of excess sectors] fewer sectors ….”

For test cases 10, 23, and 38, additional steps are required to verify that the tool has not altered any excess sectors. When a FAT partition is formatted, the sectors in the lower addresses are modified to contain the FAT table and other information. The sectors in the high addresses are not changed and retain any content from before the partition is formatted. Therefore, the content of the excess sectors can be reliably known. However, NTFS and Linux ext2 partitions have control information (e.g., inodes) scattered throughout the partition. Therefore, to verify that the excess sectors are undisturbed by dd, a hash of the excess sectors is computed before and after
running dd. The before hash appears in the Log file highlights box and is labeled Before dd. The after hash appears in the Log file highlights box and is labeled After dd. If the excess sectors are unchanged, then the hash values are the same.

8. Test Results Summaries

<table>
<thead>
<tr>
<th>Case DI(Linux)-01 for FreeBSD 4.4 dd</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Case Summary:</strong> Copy a LINUX IDE source disk to a LINUX IDE destination disk where the source disk is smaller than the destination</td>
</tr>
<tr>
<td><strong>Tester Name:</strong> SN</td>
</tr>
<tr>
<td><strong>Test Date:</strong> Fri Oct 18 11:18:23 2002</td>
</tr>
<tr>
<td><strong>PC:</strong> Cadfael</td>
</tr>
<tr>
<td><strong>Disks:</strong></td>
</tr>
<tr>
<td>Source: DOS Drive 80 Physical Label F6</td>
</tr>
<tr>
<td>Destination: DOS Drive 81 Physical Label 92</td>
</tr>
<tr>
<td>Image media: DOS Drive 80 Physical Label 20</td>
</tr>
<tr>
<td>F6 is an IBM-DTLA-307020 with 40188960 sectors</td>
</tr>
<tr>
<td>92 is a WDC WD300BB-00CAA0 with 58633344 sectors</td>
</tr>
<tr>
<td>20 is a SEAGATE ST373405LC with 143374740 sectors</td>
</tr>
<tr>
<td>Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts</td>
</tr>
<tr>
<td>CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0</td>
</tr>
<tr>
<td><strong>Source disk setup:</strong> Windows 2000 with NTFS &amp; Fat32</td>
</tr>
<tr>
<td><strong>Host:</strong> Wimsey</td>
</tr>
<tr>
<td><strong>Operator:</strong> JRL</td>
</tr>
<tr>
<td><strong>OS:</strong> Windows 2000</td>
</tr>
<tr>
<td><strong>Date:</strong> Sat Jul 21 15:53:12 2001</td>
</tr>
<tr>
<td><strong>DISKWIPE.EXE F6_SRC Wimsey 80 F6 /src /new_log /noask /comment Windows 2000/NT source X:\pm\pqmagic /cmd=X:\pm\nt-src.txt Load Operating System to Source disk DISKHASH.EXE LX-27 Morse 80 /before</strong></td>
</tr>
<tr>
<td><strong>Disk hash</strong> = 8034683D5D55BA51409AC7B5CB0845CA2CF6B235</td>
</tr>
<tr>
<td><strong>Destination Setup:</strong> Z:\ss\DISKWIPE.EXE 01 Cadfael 81 92 /noask /dst /new_log /comment SN</td>
</tr>
<tr>
<td><strong>Execute:</strong> Boot to DOS Z:\ss\DISKWIPE.EXE 01 Cadfael 81 92 /noask /dst /new_log /comment SN Boot to FreeBSD</td>
</tr>
<tr>
<td>dd_copy (copy)</td>
</tr>
<tr>
<td>dd if=/dev/ad0 of=/dev/ad1 bs=512</td>
</tr>
<tr>
<td>Shutdown FreeBSD, Boot to DOS Z:\ss\DISKCOMP.EXE 01 Cadfael 80 F6 81 92 /new_log /comment SN</td>
</tr>
<tr>
<td><strong>Log files loc:</strong> test-archive/dd/freebsd-4.4/01</td>
</tr>
<tr>
<td><strong>Log File</strong> dd_copy (copy)</td>
</tr>
<tr>
<td><strong>Highlights:</strong> Command: dd if=/dev/ad0 of=/dev/ad1 bs=512</td>
</tr>
<tr>
<td>40188960+0 records in</td>
</tr>
<tr>
<td>40188960+0 records out</td>
</tr>
<tr>
<td>2057674520 bytes transferred in 6190.879944 secs (3323719 bytes/sec)</td>
</tr>
<tr>
<td>--- Error messages ---</td>
</tr>
<tr>
<td>no message</td>
</tr>
<tr>
<td>- - - Measurement Logs - - -</td>
</tr>
<tr>
<td>Sectors Computed 40188960</td>
</tr>
<tr>
<td>Sectors Differ 0</td>
</tr>
<tr>
<td>Sectors Differ range</td>
</tr>
<tr>
<td>Source (40188960) has 18444384 fewer sectors than destination (58633344)</td>
</tr>
<tr>
<td>Zero fill: 0</td>
</tr>
<tr>
<td>Src Byte fill (F6): 0</td>
</tr>
<tr>
<td>Dst Byte fill (92): 18444384</td>
</tr>
<tr>
<td>Other fill: 0</td>
</tr>
<tr>
<td>Other no fill: 0</td>
</tr>
<tr>
<td>Hash after test: 8034683D5D55BA51409AC7B5CB0845CA2CF6B235</td>
</tr>
<tr>
<td><strong>Expected Results:</strong> Source disk is unchanged</td>
</tr>
<tr>
<td>src compares qualified equal to dst</td>
</tr>
<tr>
<td><strong>Actual Results:</strong> No anomalies</td>
</tr>
</tbody>
</table>
## Results:

<table>
<thead>
<tr>
<th>Case DI(Linux)-02 for FreeBSD 4.4 dd</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Case Summary:</strong> Copy a LINUX IDE source disk to a LINUX IDE destination disk where the source disk is the same size as the destination</td>
</tr>
<tr>
<td><strong>Tester Name:</strong> JRL</td>
</tr>
<tr>
<td><strong>Test Date:</strong> Mon Oct 21 08:23:30 2002</td>
</tr>
<tr>
<td><strong>PC:</strong> McCloud</td>
</tr>
<tr>
<td><strong>Disks:</strong></td>
</tr>
<tr>
<td>Source: DOS Drive 80 Physical Label F5</td>
</tr>
<tr>
<td>Destination: DOS Drive 81 Physical Label F7</td>
</tr>
<tr>
<td>Image media: DOS Drive 80 Physical Label 93</td>
</tr>
<tr>
<td>F5 is an IBM-DTLA-307020 with 40188960 sectors</td>
</tr>
<tr>
<td>F7 is an IBM-DTLA-307020 with 40188960 sectors</td>
</tr>
<tr>
<td>93 is a WDC WD320BB-00CAA0 with 58633344 sectors</td>
</tr>
<tr>
<td><strong>Source disk setup:</strong> Dual boot Linux/Windows Me with EXT2 &amp; Fat16</td>
</tr>
<tr>
<td>Disk: F5</td>
</tr>
<tr>
<td>Host: Cadfael</td>
</tr>
<tr>
<td>OS: WindowsMe/Linux</td>
</tr>
<tr>
<td>Date: Sat Aug 11 11:13:43 2001</td>
</tr>
<tr>
<td>DISKWIPE.EXE F5_SRC Cadfael 80 F5 /src X:\pm\pqmagic /cmd=X:\pm\fat-src.txt</td>
</tr>
<tr>
<td>Load Operating System to Source disk</td>
</tr>
<tr>
<td>DISKHASH.EXE F5_SRC Cadfael 80 /before</td>
</tr>
<tr>
<td>Disk hash = 83A0002816BBF089F8BE33C41C92C3B5A0F42A54</td>
</tr>
<tr>
<td><strong>Destination Setup:</strong> Z:\ss\DISKWIPE.EXE 02 McCloud 81 F7 /noask /dst /new_log /comment JRL</td>
</tr>
<tr>
<td><strong>Execute:</strong></td>
</tr>
<tr>
<td>Boot to DOS</td>
</tr>
<tr>
<td>Z:\ss\DISKWIPE.EXE 02 McCloud 81 F7 /noask /dst /new_log /comment JRL</td>
</tr>
<tr>
<td>Boot to FreeBSD</td>
</tr>
<tr>
<td>dd_copy (copy)</td>
</tr>
<tr>
<td>dd if=/dev/ad1 of=/dev/ad3 bs=512</td>
</tr>
<tr>
<td>Shutdown FreeBSD, Boot to DOS</td>
</tr>
<tr>
<td>Z:\ss\DISKSCMP.EXE 02 McCloud 80 F5 81 F7 /new_log /comment JRL</td>
</tr>
<tr>
<td>Z:\ss\DISKHASH.EXE 02 Wimsey 80 /comment F5(JRL) /new_log /after</td>
</tr>
<tr>
<td>Log files loc: test-archive/dd/freebsd-4.4/02</td>
</tr>
<tr>
<td><strong>Log File</strong></td>
</tr>
<tr>
<td>dd_copy (copy)</td>
</tr>
<tr>
<td>Command: dd if=/dev/ad1 of=/dev/ad3 bs=512</td>
</tr>
<tr>
<td>40188960+0 records in</td>
</tr>
<tr>
<td>40188960+0 records out</td>
</tr>
<tr>
<td>2057674520 bytes transferred in 9381.802960 secs (2193262 bytes/sec)</td>
</tr>
<tr>
<td>--- Error messages ---</td>
</tr>
<tr>
<td>no message</td>
</tr>
<tr>
<td>- - - Measurement Logs - - -</td>
</tr>
<tr>
<td>Sectors Compared 40188960</td>
</tr>
<tr>
<td>Sectors Differ 0</td>
</tr>
<tr>
<td>Diffs range</td>
</tr>
<tr>
<td>Hash after test: 83A0002816BBF089F8BE33C41C92C3B5A0F42A54</td>
</tr>
<tr>
<td><strong>Expected Results:</strong></td>
</tr>
<tr>
<td>Source disk is unchanged</td>
</tr>
<tr>
<td>src compares equal to dst</td>
</tr>
<tr>
<td><strong>Actual Results:</strong> No anomalies</td>
</tr>
<tr>
<td><strong>Analysis:</strong> Expected results achieved</td>
</tr>
</tbody>
</table>

---

## Results:

<table>
<thead>
<tr>
<th>Case DI(Linux)-03 for FreeBSD 4.4 dd</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Case Summary:</strong> Copy a LINUX IDE source disk to a LINUX IDE destination disk where the source disk is larger than the destination</td>
</tr>
<tr>
<td><strong>Tester Name:</strong> JRL</td>
</tr>
<tr>
<td><strong>Test Date:</strong> Sat Oct 19 13:38:16 2002</td>
</tr>
<tr>
<td><strong>PC:</strong> McCloud</td>
</tr>
<tr>
<td><strong>Disks:</strong></td>
</tr>
<tr>
<td>Source: DOS Drive 80 Physical Label F5</td>
</tr>
<tr>
<td>Destination: DOS Drive 81 Physical Label 64</td>
</tr>
<tr>
<td>Image media: DOS Drive 80 Physical Label 93</td>
</tr>
<tr>
<td>F5 is an IBM-DTLA-307020 with 40188960 sectors</td>
</tr>
<tr>
<td>64 is a WDC WD64AA with 12594960 sectors</td>
</tr>
</tbody>
</table>
93 is a WDC WD300BB-00C6A0 with 58633344 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup:
Dual boot Linux/Windows Me with EXT2 & Fat16
Disk: F5
Host: Cadfael
Operator: JRL
OS: WindowsMe/Linux
Date: Sat Aug 11 11:13:43 2001

DISKWIPE.EXE F5_SRC Cadfael 80 F5 /src
X:\pm\pqmagic /cmd=X:\pm\fat-src.txt
Load Operating System to Source disk
DISKHASH.EXE F5_SRC Cadfael 80 /before

Disk hash = 83A0002816BBF089F8BE33C41C92C3B5A0F42A54

Destination Setup:
Z:\\as\DISKWIPE.EXE 03 McCloud 81 64 /noask /dst /new_log /comment JRL

Execute:
Boot to DOS
Z:\\as\DISKWIPE.EXE 03 McCloud 81 64 /noask /dst /new_log /comment JRL
Boot to FreeBSD
dd_copy (copy)
dd if=/dev/ad1 of=/dev/ad3 bs=512
end of device
Shutdown FreeBSD, Boot to DOS
Z:\\as\DISKCMP.EXE 03 McCloud 80 F5 81 64 /new_log /comment JRL
Z:\\as\DISKHASH.EXE 03 McCloud 80 /comment F5(JRL) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4/03

Log File
Highlights:
 Command: dd if=/dev/ad1 of=/dev/ad3 bs=512
12594961+0 records in
12594960+0 records out
6448619520 bytes transferred in 21097.421116 secs (305659 bytes/sec)
--- Error messages ---
dd: /dev/ad3: end of device
- - - Measurement Logs - - -
Sectors Compared 12594960
Sectors Differ 0
Diffs range
Source (40188960) has 27594000 more sectors than destination (12594960)
Hash after test: 83A0002816BBF089F8BE33C41C92C3B5A0F42A54

Expected Results:
Source disk is unchanged
src compares qualified equal to dst, src is truncated on dst
truncation is logged

Actual Results:
No anomalies

Analysis:
Expected results achieved

Case DI(Linux)-04 for FreeBSD 4.4 dd

Case Summary:
Copy a LINUX IDE source disk
to a LINUX IDE destination disk
and the source contains a FAT16 partition
where the source disk is smaller than the destination

Tester Name: JRL
Test Date: Thu Jan 09 12:30:25 2003
PC: Cadfael

Disks:
Source: DOS Drive 80 Physical Label F5
Destination: DOS Drive 81 Physical Label F7
Image media: DOS Drive 80 Physical Label 7A
F5 is an IBM-DTLA-307020 with 40188960 sectors
F7 is an IBM-DTLA-307020 with 40188960 sectors
7A is a MAXTOR 6L040J2 with 78177792 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup:
Dual boot Linux/Windows Me with EXT2 & Fat16
Disk: F5
Host: Cadfael
Operator: JRL
OS: WindowsMe/Linux
Date: Sat Aug 11 11:13:43 2001

DISKWIPE.EXE F5_SRC Cadfael 80 F5 /src
X:\pm\pqmagic /cmd=X:\pm\fat-src.txt
Load Operating System to Source disk  
DISKHASH.EXE F5_SRC Cadfael 80 /before  

Disk hash = 83A0002816BBF089F8BE33C41C92C3B5A0F42A54

**Destination Setup:**  
Z:\ss\DISKWIPE.EXE 04 cadfael 81 F7 /noask /dst /new_log /comment JRL

**Execute:**  
Boot to DOS  
Z:\ss\DISKWIPE.EXE 04 cadfael 81 F7 /noask /dst /new_log /comment JRL  
Boot to FreeBSD  
dd_copy (copy)  
dd if=/dev/ad1s1 of=/dev/ad3s1 bs=512  
Shutdown FreeBSD, Boot to DOS  
Z:\ss\PARTCMP.EXE 04 Cadfael 80 F5 81 F7 /new_log /comment JRL /select 1 1  
Z:\ss\DISKHASH.EXE 04 Cadfael 80 /comment F5(JRL) /new_log /after

**Log files loc:**  
test-archive/dd/freebsd-4.4/04

| Log File | Source disk Drive 0x80, BIOS: Extensions Present  
Interrupt 13 bios 1023/254/63 (max cyl/hd values)  
Interrupt 13 ext 16383/016/63 (number of cyl/hd)  
40189960 total number of sectors reported via interrupt 13 from the BIOS  
N Start LBA Length Start C/H/S End C/H/S boot Partition type  
1 P 0000000063 001236942 0000/001/01 0076/254/63 Boot 06 Fat16  
2 X 002249100 007181055 0140/000/01 0586/254/63 05 extended  
3 S 0000000063 00208782 00152/254/63 83 Linux  
4 X 00208845 00144585 0153/001/01 0161/254/63 05 extended  
5 S 0000000063 00144522 0153/001/01 0161/254/63 06 Fat16  
6 X 0004500005 00192780 0417/001/01 0428/254/63 05 extended  
7 S 0000000063 00192717 0417/001/01 0428/254/63 16 other  
8 S 0000000000 0000000000 0000/000/00 0000/000/00 00 empty entry  
9 P 009430155 006152895 0586/000/01 0969/254/63 82 Linux swap  
10 P 039760875 000417690 1023/000/01 1023/254/63 83 Linux swap  
Destination disk Drive 0x81, BIOS: Extensions Present  
Interrupt 13 bios 1023/254/63 (max cyl/hd values)  
Interrupt 13 ext 16383/016/63 (number of cyl/hd)  
40189960 total number of sectors reported via interrupt 13 from the BIOS  
N Start LBA Length Start C/H/S End C/H/S boot Partition type  
1 P 0000000063 001333332 0000/001/01 0082/254/63 06 Fat16  
2 P 0000000000 0000000000 0000/000/00 0000/000/00 00 empty entry  
3 P 0000000000 0000000000 0000/000/00 0000/000/00 00 empty entry  
4 P 0000000000 0000000000 0000/000/00 0000/000/00 00 empty entry  

**dd_copy (copy)**  
Command: dd if=/dev/ad1s1 of=/dev/ad3s1 bs=512  
1236942+0 records in  
1236942+0 records out  
633314304 bytes transferred in 288.918185 secs (2192020 bytes/sec)  
--- Error messages ---  
no message  
- - - - Measurement Logs - - - -  
Sectors Compared 1236942  
Sectors Differ 0  
Diffs range:  
Source (1236942) has 96390 fewer sectors than destination (1333332)  
Zero fill: 0  
Src Byte fill (F5): 0  
Dst Byte fill (F7): 96390  
Other fill: 0  
Other no fill: 0  
Hash after test: 83A0002816BBF089F8BE33C41C92C3B5A0F42A54

**Expected Results:**  
Source disk is unchanged  
src compares qualified equal to dst

**Actual Results:**  
No anomalies

**Analysis:**  
Expected results achieved

**Case DI(Linux)-05 for FreeBSD 4.4 dd**  
**Case Summary:**  
Copy a LINUX IDE source disk  
to a LINUX IDE destination disk  
and the source contains a FAT32 partition  
where the source disk is the same size as the destination

**Tester Name:** JRL  
**Test Date:** Sun Oct 20 11:22:35 2002
PC: HecRamsey

Disks:
- Source: DOS Drive 80 Physical Label A5
- Destination: DOS Drive 81 Physical Label A8
- Image media: DOS Drive 80 Physical Label 9E

A5 is a WDC WD200BB-00AUA1 with 39102336 sectors
A8 is a WDC WD200BB-00AUA1 with 39102336 sectors
9E is a WDC WD200BB-32CFC0 with 39102336 sectors

Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk
- setup: Fat32 only
- Host: JudgeDee
- Operator: JRL
- OS: NoOs
- Options: none
- Date: Mon Apr 15 14:35:04 2002

```
cmd: Z:\ss\DISKWIPE.EXE A5 JudgeDee 80 A5 /src /new_log
X:\pm\pqmagic /cmd=X:\pm\f32-src.txt
No OS loaded, FAT32 partition only
```

```
cmd: Z:\ss\DISKHASH.EXE A5 JudgeDee 80 /before /new_log
```

Disk hash = 3DE5C01B5BB337EA3E6CF9BC25EB844F5D00FD14

Destination
- Setup:
```
Z:\ss\DISKWIPE.EXE 05 HecRamsey 81 A8 /noask /dst /new_log /comment JRL
X:\pm\pqmagic /cmd=X:\pm\f32-src.txt
```

Execute:
- Boot to DOS
```
Z:\ss\DISKWIPE.EXE 05 HecRamsey 81 A8 /noask /dst /new_log /comment JRL
Boot to FreeBSD
```

```
dd_copy (copy)
dd if=/dev/ad1s1 of=/dev/ad3s1 bs=512
Shutdown FreeBSD, Boot to DOS
Z:\ss\PARTCMP.EXE 05 HecRamsey 80 A5 81 A8 /new_log /comment JRL
/select 1 1
Z:\ss\DISKHASH.EXE 05 Wimsey 80 /comment A5(JRL) /new_log /after
```

Log files loc: test-archive/dd/freebsd-4.4/05

Log File
- Source disk Drive 0x80, BIOS: Extentions Present
- Interrupt 13 bios 1022/254/63 (max cyl/hd values)
- Interrupt 13 ext 16383/016/63 (number of cyl/hd)
- 39102336 total number of sectors reported via interrupt 13 from the BIOS

<table>
<thead>
<tr>
<th>N Start LBA Length Start C/H/S End C/H/S Boot Partition type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 P 000000063 001236942 0000/001/01 0076/254/63 Boot 0B Fat32</td>
</tr>
<tr>
<td>2 X 001429785 037061955 0089/000/01 1023/254/63 0F extended</td>
</tr>
<tr>
<td>3 S 000000063 00208782 0089/001/01 0101/254/63 83 Linux</td>
</tr>
<tr>
<td>4 X 00208845 00144585 0102/000/01 0110/254/63 05 extended</td>
</tr>
<tr>
<td>5 S 000000063 00144522 0102/001/01 0110/254/63 0B Fat32</td>
</tr>
<tr>
<td>6 X 000771120 00192780 0137/000/01 0148/254/63 05 extended</td>
</tr>
<tr>
<td>7 S 000000063 290192717 0137/001/01 0148/254/63 16 other</td>
</tr>
<tr>
<td>8 S 000000000 000000000 0000/000/00 0000/000/00 00 empty entry</td>
</tr>
<tr>
<td>9 P 038491740 00064260 1023/000/01 1023/254/63 83 Linux</td>
</tr>
<tr>
<td>10 P 038684520 000417690 1023/000/01 1023/254/63 82 Linux swap</td>
</tr>
</tbody>
</table>

Destination disk Drive 0x81, BIOS: Extensions Present
- Interrupt 13 bios 1022/254/63 (max cyl/hd values)
- Interrupt 13 ext 16383/016/63 (number of cyl/hd)
- 39102336 total number of sectors reported via interrupt 13 from the BIOS

<table>
<thead>
<tr>
<th>N Start LBA Length Start C/H/S End C/H/S Boot Partition type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 P 000000063 001236942 0000/001/01 0076/254/63 Boot 0B Fat32</td>
</tr>
<tr>
<td>2 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry</td>
</tr>
<tr>
<td>3 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry</td>
</tr>
<tr>
<td>4 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry</td>
</tr>
</tbody>
</table>

```
Command: dd if=/dev/ad1s1 of=/dev/ad3s1 bs=512
1236942+0 records in
1236942+0 records out
63314304 bytes transferred in 284.536470 secs (2225776 bytes/sec)
```

--- Error messages ---
- no message
- Measurement Logs
- Sectors Compared 1236942
- Sectors Differ 0
- Diff range:
- Hash after test: 3DE5C01B5BB337EA3E6CF9BC25EB844F5D00FD14

Expected
- Source disk is unchanged
Case DI(Linux)-06 for FreeBSD 4.4 dd

Case Summary: Copy a LINUX IDE source disk to a LINUX IDE destination disk and the source contains a LINUX partition where the source disk is larger than the destination

Tester Name: JRL
Test Date: Fri Nov 01 15:12:47 2002
PC: AndWife

Disks:
Source: DOS Drive 80 Physical Label F5
Destination: DOS Drive 81 Physical Label 62
Image media: DOS Drive 80 Physical Label 93
F5 is an IBM-DTLA-307020 with 40188960 sectors
62 is a WDC WD300BB-00CAA0 with 58633344 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup:
Dual boot Linux/Windows Me with EXT2 & Fat16
Disk: F5
Host: Cadfael
Operator: JRL
OS: WindowsMe/Linux
Date: Sat Aug 11 11:13:43 2001
DISKWIPE.EXE F5_SRC Cadfael 80 F5 /src
X:\pm\pqmagic /cmd=X:\pm\fat-src.txt
Load Operating System to Source disk
DISKHASH.EXE F5_SRC Cadfael 80 /before
Disk hash = 83A0002816BBF089F8BE33C41C92C3B5A0F42A54

Destination Setup:
Z:\as\DISKWIPE.EXE 06 AndWife 81 62 /noask /dst /new_log /comment JRL

Execute:
Boot to DOS
Z:\as\DISKWIPE.EXE 06 AndWife 81 62 /noask /dst /new_log /comment JRL
Boot to FreeBSD
dd_copy (copy)
dd if=-dev/ad1s3 of=-dev/ad3s2 bs=512
end of device
Shutdown FreeBSD, Boot to DOS
Z:\as\PARTCMP.EXE 06 AndWife 80 F5 81 62 /new_log /comment JRL /select 9 2
Z:\as\DISKHASH.EXE 06 Rumpole 80 /comment F5(JRL) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4/06

Log File
Source disk Drive 0x80, BIOS: Extensains Present
Interrupt 13 bios 1022/254/63 (max cyl/ hd values)
Interrupt 13 ext 16383/016/63 (number of cyl/hd)
40188960 total number of sectors reported via interrupt 13 from the BIOS

N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 0000000063 001236942 0000/001/01 0076/254/63 Boot 06 Fat16
2 X 002249100 007181055 0140/000/01 0586/254/63 05 extended
3 S 0000000063 002008782 0140/000/01 0152/254/63 83 Linux
4 X 000208845 000144585 0153/000/01 0161/254/63 05 extended
5 S 0000000063 000144522 0153/000/01 0161/254/63 82 Linux swap
6 X 004450005 00192717 0417/001/01 0428/254/63 16 other
7 S 0000000063 00192717 0417/001/01 0428/254/63 16 other
8 S 0000000000 000000000 0000/000/00 0000/000/00 00 empty entry
9 P 009430155 006152895 0587/000/01 0969/254/63 83 Linux
10 P 039760875 000417690 1023/000/01 1023/254/63 82 Linux swap

Destination disk Drive 0x81, BIOS: Extensains Present
Interrupt 13 bios 0782/254/63 (max cyl/ hd values)
Interrupt 13 ext 13328/015/63 (number of cyl/hd)
12594960 total number of sectors reported via interrupt 13 from the BIOS

N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 0000000063 001236942 0000/001/01 0076/254/63 06 Fat16
2 P 001237005 005944050 0140/000/01 0446/254/63 83 Linux
3 P 0000000000 000000000 0000/000/00 0000/000/00 00 empty entry
4 P 0000000000 000000000 0000/000/00 0000/000/00 00 empty entry
dd_copy (copy)
Command: dd if=/dev/ad1s3 of=/dev/ad3s2 bs=512
5944051+0 records in
5944050+0 records out
3043353600 bytes transferred in 12239.447636 secs (248651 bytes/sec)
--- Error messages ---
  dd: /dev/ad3s2: end of device
  --- Measurement Logs ---
  Sectors Compared 5944050
  Sectors Differ 0
  Diffs range:
  Source (6152895) has 208845 more sectors than destination (5944050)
  Hash after test: 83A0002816BBF089F8BE3C1C92C1B5A0F42A54

Expected Results:
Source disk is unchanged
src compares qualified equal to dst, src is truncated on dst
truncation is logged

Actual Results:
No anomalies

Analysis:
Expected results achieved

---

Case DI(Linux)-07 for FreeBSD 4.4 dd

Case Summary:
Copy a LINUX SCSI source disk
to a LINUX SCSI destination disk
where the source disk is smaller than the destination

Test Date: Fri Oct 18 08:58:10 2002
PC: Rumpole

Disks:
Source: DOS Drive 80 Physical Label E4
Destination: DOS Drive 81 Physical Label E6
Image media: DOS Drive 80 Physical Label 71
E4 is a QUANTUM ATLAS10K2-TY092J with 17938985 sectors
E6 is a SEAGATE ST318404LC with 35843670 sectors
71 is a IC35L040AVER07-0 with 80418240 sectors

Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup:
Windows 2000 with NTFS & Fat32
Disk: E4
Host: JudgeDee
Operator: JRL
OS: Windows 2000/NT
Date: Sat Jul 21 16:58:28 2001

DISKWIPE.EXE E4_SRC JudgeDee 80 E4 /noask /comment Windows 2000
source disk
X:\pm\pqmagic /cmd=X:\pm\nt-src.txt
Load Operating System to Source disk
cmd: X:\ss\DISKHASH.EXE Hash Wimsey 80 /comment E4 /new_log /before
Disk hash = 25BF8AF6B2D3E0BD1909C96E368DB27F51C49CBF

Destination setup:
Z:\ss\DISKWIPE.EXE 07 Rumpole 81 E6 /noask /dst /new_log /comment SN

Execute:
Boot to DOS
Z:\\ss\DISKWIPE.EXE 07 Rumpole 81 E6 /noask /dst /new_log /comment SN
Boot to FreeBSD
dd_copy (copy)
  dd if=/dev/da0 of=/dev/da1 bs=512
Shutdown FreeBSD, Boot to DOS
Z:\\ss\DISKCOMP.EXE 07 Rumpole 80 E4 81 E6 /new_log /comment SN
Z:\\ss\DISKHASH.EXE 07 Rumpole 80 /comment E4(SN) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4/07

Log File: dd_copy (copy)
Command: dd if=/dev/da0 of=/dev/da1 bs=512
17938985+0 records in
17938985+0 records out
918476320 bytes transferred in 2066.398884 secs (4444815 bytes/sec)
--- Error messages ---
  no message
  --- Measurement Logs ---
  Sectors Compared 17938985
  Sectors Differ 0
  Diffs range:
  Source (17938985) has 17904685 fewer sectors than destination
  (35843670)
**Case DI(Linux)-08 for FreeBSD 4.4 dd**

**Case Summary:** Copy a LINUX SCSI source disk to a LINUX SCSI destination disk where the source disk is the same size as the destination.

**Tester Name:** JRL

**Test Date:** Sat Oct 19 12:23:15 2002

**PC:** Rumpole

**Disks:**
- **Source:** DOS Drive 80 Physical Label E4
- **Destination:** DOS Drive 81 Physical Label E2
- **Image media:** DOS Drive 80 Physical Label 71
- **E4:** QUANTUM ATLAS10K2-TY092J with 17938985 sectors
- **E2:** QUANTUM ATLAS10K2-TY092J with 17938985 sectors
- **71:** IC35L040AVER07-0 with 80418240 sectors

**Source disk setup:**
- Windows 2000 with NTFS & Fat32
- **Disk:** E4
- **Host:** JudgeDee
- **Operator:** JRL
- **OS:** Windows 2000/NT
- **Date:** Sat Jul 21 16:58:28 2001

- `DISKWIPE.EXE E4_SRC JudgeDee 80 E4 /noask /comment Windows 2000 source disk`
- `X:\pm\pqmagic /cmd=X:\pm\nt-src.txt`
- `Load Operating System to Source disk`
- `cmd: X:\ss\DISKHASH.EXE Hash Wimsey 80 /comment E4 /new_log /before`

**Destination Setup:**
- `Z:\ss\DISKWIPE.EXE 08 Rumpole 81 E2 /noask /dst /new_log /comment JRL`

**Execute:**
- **Boot to DOS**
- Z:\ss\DISKWIPE.EXE 08 Rumpole 81 E2 /noask /dst /new_log /comment JRL
- **Boot to FreeBSD**
- `dd_copy (copy)`
- `Command: dd if=/dev/da0 of=/dev/da1 bs=512`
- `Shutdown FreeBSD, Boot to DOS`
- `Z:\ss\DISKCMP.EXE 08 Rumpole 80 E4 81 E2 /new_log /comment JRL`
- `Z:\ss\DISKHASH.EXE 08 Rumpole 80 /comment E4(JRL) /new_log /after`

**Log files loc:** test-archive/dd/freebsd-4.4/08

**Log File Highlights:**
- `dd_copy (copy)`
- `Command: dd if=/dev/da0 of=/dev/da1 bs=512`
- `17938985+0 records in`
- `17938985+0 records out`
- `9184760320 bytes transferred in 4245.450263 secs (2163436 bytes/sec)`
- `=== Error messages ===`
- `no message`
- `== Measurement Logs ==`
- `Sectors Compared 17938985`
- `Sectors Differ 0`
- `Diffs range`
- `Hash after test: 25BF8AF6B2D3E0BD1909C96E368DB27F51C49CBF`

**Expected Results:** Source disk is unchanged

**Actual Results:**
- Source disk is unchanged
- No anomalies

**Analysis:** Expected results achieved
to a LINUX SCSI destination disk
where the source disk is larger than the destination

Tester Name: JRL
Test Date: Sat Oct 19 15:00:59 2002
PC: HecRamsey

Disks:
Source: DOS Drive 80 Physical Label E3
Destination: DOS Drive 81 Physical Label EB
Image media: DOS Drive 80 Physical Label 9E
E3 is a QUANTUM ATLAS10K2-TY092J with 17938985 sectors
EB is a SEAGATE ST39204LC with 17921835 sectors
9E is a WDC WD200BB-32CFC0 with 39102336 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup:
Dual boot Linux/Windows Me with EXT2 & Fat16
Disk: E3
Host: Cadfael
Operator: JRL
OS: Linux Red Hat 7.1/Windows Me
Date: Sat Jul 21 16:17:29 2001
DISKWIPE.EXE E3_SRC Rumpole 80 E3 /src /new_log
X:\pm\pqmagic /cmd=X:\pm\fat-src.txt
Load Operating System to Source disk
DISKHASH.EXE E3_SRC Rumpole 80 /before
Disk hash = 0F9DACDA6C63D197C048782003D324108CEC7AB0

Destination Setup:
Z:\ss\DISKWIPE.EXE 09 HecRamsey 81 EB /noask /dst /new_log /comment JRL
Execute:
Boot to DOS
Z:\ss\DISKWIPE.EXE 09 HecRamsey 81 EB /noask /dst /new_log /comment JRL
Boot to FreeBSD
dd_copy (copy)
dd if=/dev/da0 of=/dev/da1 bs=512
end of device
Shutdown FreeBSD, Boot to DOS
Z:\ss\DISKCMP.EXE 09 Rumpole 80 E3 81 EB /new_log /comment JRL
Z:\ss\DISKHASH.EXE 09 Rumpole 80 /comment E3(JRL) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4/09

Log File
dd_copy (copy)
Command: dd if=/dev/da0 of=/dev/da1 bs=512
17921836+0 records in
17921835+0 records out
9175979520 bytes transferred in 2063.534783 secs (4446729 bytes/sec)
=== Error messages ===
dd: /dev/da1: end of device
- - - Measurement Logs - - -
Sectors Compared 17921835
Sectors Differ 0
Diffs range
Source (17938985) has 17150 more sectors than destination (17921835)
Hash after test: 0F9DACDA6C63D197C048782003D324108CEC7AB0

Expected Results:
Source disk is unchanged
src compares qualified equal to dst, src is truncated on dst
truncation is logged

Actual Results:
No anomalies

Analysis:
Expected results achieved

Case DI(Linux)-10 for FreeBSD 4.4 dd

Case Summary: Copy a LINUX SCSI source disk
to a LINUX SCSI destination disk
and the source contains a NTFS partition
where the source disk is smaller than the destination

Tester Name: JRL
Test Date: Thu Nov 07 13:40:18 2002
PC: Cadfael

Disks:
Source: DOS Drive 80 Physical Label 31
Destination: DOS Drive 81 Physical Label 33
Image media: DOS Drive 80 Physical Label 7A
31 is a FUJITSU MAG3091L SUN9.0G with 17689266 sectors
33 is a FUJITSU MAG3091L SUN9.0G with 17689266 sectors
7A is a MAXTOR 6L040J2 with 78177792 sectors
Source disk setup:
NTFS only
Disk: 31
Host: Cadfael
Operator: JRL
OS: NT_No_os
Options: none
Date: Thu Nov 07 12:05:40 2002

cmd: Z:\ss\DISKWIPE.EXE 31 Cadfael 80 31 /src /new_log
X:\pm\pqmagic /cmd=X:\pm\nt-src.txt
No OS loaded, NTFS partition only

cmd: Z:\ss\DISKHASH.EXE 31 Cadfael 80 /before /new_log
Disk hash = 595739865F30C86E3CE5BA03BF1895E008721B8D

Destination setup:
Z:\ss\DISKWIPE.EXE 10 Cadfael 81 33 /noask /dst /new_log /comment JRL

Execute:
Boot to DOS
Z:\ss\DISKWIPE.EXE 10 Cadfael 81 33 /noask /dst /new_log /comment JRL
A:\SECHASH.EXE 10 Cadfael 81 /first 1237005 /last 1333394 /log
prehash.txt
Boot to FreeBSD
dd_copy (copy)

dd if=/dev/da0s1 of=/dev/da1s1 bs=512
A:\SECHASH.EXE 10 Cadfael 81 /first 1237005 /last 1333394 /log
posthash.txt
Shutdown FreeBSD, Boot to DOS
Z:\ss\PARTCMP.EXE 10 Cadfael 80 31 81 33 /new_log /comment JRL /select 1 1
Z:\ss\DISKHASH.EXE 10 Cadfael 80 /comment 31(JRL) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4.10

Log File
Source disk Drive Ox80, BIOS: Extensions Present
Interrupt 13 ext 01023/255/63 (number of cyl/hd)
17689267 total number of sectors reported via interrupt 13 from the BIOS

N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 0000000063 001236942 0000/001/01 0076/254/63 07 NTFS
2 P 0000000000 0000000000 0000/000/00 0000/000/00 00 empty entry
3 P 0000000000 0000000000 0000/000/00 0000/000/00 00 empty entry
4 P 0000000000 0000000000 0000/000/00 0000/000/00 00 empty entry

Destination disk Drive Ox81, BIOS: Extensions Present
Interrupt 13 ext 01023/255/63 (number of cyl/hd)
17689267 total number of sectors reported via interrupt 13 from the BIOS
N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 0000000063 001333332 0000/001/01 0082/254/63 07 NTFS
2 P 0000000000 0000000000 0000/000/00 0000/000/00 00 empty entry
3 P 0000000000 0000000000 0000/000/00 0000/000/00 00 empty entry
4 P 0000000000 0000000000 0000/000/00 0000/000/00 00 empty entry
dd_copy (copy)

Command: dd if=/dev/da0s1 of=/dev/da1s1 bs=512
1236942+0 records in
1236942+0 records out
633314304 bytes transferred in 7422.884209 secs (85319 bytes/sec)
--- Error messages ---
no message
--- Measurement Logs ---
Sources Compared 1236942
Sectors Differ 0
Diffs range:
Source (1236942) has 96390 fewer sectors than destination (1333332)
Zero fill: 0
Src Byte fill (31): 0
Dst Byte fill (33): 96389
Other fill: 0
Other no fill: 1
Excess Sectors Hashes:
Before dd DA90E58BF899C870F385368BD1544AE7D4D75BC
After dd DA90E58BF899C870F385368BD1544AE7D4D75BC
Hash after test: 595739865F30C86E3CE5BA03BF1895E008721B8D

Expected Source disk is unchanged
**Case DI(Linux)-11 for FreeBSD 4.4 dd**

**Case Summary:** Copy a LINUX SCSI source disk to a LINUX SCSI destination disk and the source contains a FAT32 partition where the source disk is the same size as the destination.

**Tester Name:** SN  
**Test Date:** Fri Nov 01 11:09:05 2002  
**PC:** Wimsey

**Disks:**  
- **Source:** DOS Drive 80 Physical Label 1F  
  - Image media: DOS Drive 80 Physical Label 7A  
- **Destination:** DOS Drive 81 Physical Label E2  
  - 7A is a MAXTOR 6L040J2 with 78177792 sectors  

**Source disk setup:**  
- Linux EXT2 & Fat32  
- Disk: 1F  
  - Host: Paladin  
  - Operator: JRL  
  - OS: No_os  
  - Options: none  
- Date: Thu Oct 24 10:29:25 2002

**Execute:**  
- Boot to DOS
- Z:\ss\DISKWIPE.EXE 11 Wimsey 81 E2 /noask /dst /new_log /comment SN

**Destination disk setup:**  
- Z:\ss\DISKWIPE.EXE 11 Wimsey 81 E2 /noask /dst /new_log /comment SN

**Log files loc:** test-archive/dd/freebsd-4.4/11

**Log File Highlights:**  
- Source disk Drive 0x80, BIOS: Extensions Present
- Interrupt 13 ext 01023/255/63 (number of cyl/HD)
- 35916548 total number of sectors reported via interrupt 13 from the BIOS

**Log File:**  
- N Start LBA Length Start CHS End CHS/Boot Partition type  
  - 452/254/63 (max cyl/hd values)
- Interrupt 13 ext 01023/255/63 (number of cyl/HD)
- 35916548 total number of sectors reported via interrupt 13 from the BIOS

**Log File Highlights:**  
- N Start LBA Length Start CHS End CHS/Boot Partition type  
  - 452/254/63 (max cyl/hd values)
- Interrupt 13 ext 01023/255/63 (number of cyl/HD)
- 17938985 total number of sectors reported via interrupt 13 from the BIOS
dd_copy (copy)
Command: dd if=/dev/da0s1 of=/dev/da1s1 bs=512
1236942+0 records in
1236942+0 records out
633314304 bytes transferred in 289.974692 secs (2184033 bytes/sec)
--- Error messages ---
no message
- - - - Measurement Logs - - - -
Sectors Compared 1236942
Sectors Differ 0
Diff range:
Hash after test: D6AD94C3E8C2BE7AC4F60C4CE146617BC757D34D

Expected Results:
Source disk is unchanged
src compares equal to dst

Actual Results:
No anomalies

Analysis: Expected results achieved

<table>
<thead>
<tr>
<th>Case DI(Linux)-12 for FreeBSD 4.4 dd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Summary: Copy a LINUX SCSI source disk to a LINUX SCSI destination disk and the source contains a FAT16 partition where the source disk is larger than the destination</td>
</tr>
<tr>
<td>Tester Name: JRL</td>
</tr>
<tr>
<td>Test Date: Thu Jan 09 11:33:16 2003</td>
</tr>
<tr>
<td>PC: Rumpole</td>
</tr>
</tbody>
</table>

Disks:
Source: DOS Drive 80 Physical Label E3
Destination: DOS Drive 81 Physical Label E2
Image media: DOS Drive 80 Physical Label 9E
E3 is a QUANTUM ATLAS10K2-TY092J with 17938985 sectors
E2 is a QUANTUM ATLAS10K2-TY092J with 17938985 sectors
9E is a WDC WD200BB-32FC0 with 39102336 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup:
Dual boot Linux/Windows Me with EXT2 & Fat16
Disk: E3
Host: Cadfael
Operator: JRL
OS: Linux Red Hat 7.1/Windows Me
Date: Sat Jul 21 16:17:29 2001
DISKWIPE.EXE E3_SRC Rumpole 80 E3 /src /new_log
X:\pm\fat-src.txt
Load Operating System to Source disk
DISKHASH.EXE E3_SRC Rumpole 80 /before
Disk hash = 0F9DACDA6C63D197C048782003D324108CEC7AB0

Destination Setup:
Z:\ss\DISKWIPE.EXE 12 Rumpole 81 E2 /noask /dst /new_log /comment JRL

Execute:
Boot to DOS
Z:\ss\DISKWIPE.EXE 12 Rumpole 81 E2 /noask /dst /new_log /comment JRL
Boot to FreeBSD
dd_copy (copy)
dd if=/dev/da0s1 of=/dev/da1s1 bs=512
end of device
Shutdown FreeBSD, Boot to DOS
Z:\ss\PARTCMP.EXE 12 Rumpole 80 E3 81 E2 /new_log /comment JRL /select 1 1
Z:\ss\DISKHASH.EXE 12 Rumpole 80 /comment E3(JRL) /new_log /after

Log File loc: Test-archive/dd/freebsd-4.4/12

Log File Highlights:
Source disk Drive 0x80, BIOS: Extentions Present
Interrupt 13 bios 1022/254/63 (max cyl/hd values)
Interrupt 13 ext 01023/255/63 (number of cyl/hd)
17938985 total number of sectors reported via interrupt 13 from the BIOS
N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 000000063 001236942 0000/001/01 0076/254/63 Boot 06 Fat16
2 X 002249100 007181055 0140/000/01 0586/254/63 05 extended
3 S 000000063 000208782 0140/001/01 0152/254/63 83 Linux
4 x 0000208845 000144585 0153/000/01 0161/254/63 05 extended
5 S 000000063 000144522 0153/001/01 0161/254/63 06 Fat16
6 x 0044500005 000192780 0417/000/01 0428/254/63 05 extended
7 S 000000063 000192717 0417/001/01 0428/254/63 16 other
```plaintext
8 S 000000000 000000000 00000/000/00 0000/000/00 00 empty entry
9 P 009430155 006152895 0587/000/01 0969/254/63 83 Linux
10 P 017510850 000417690 1023/000/01 1023/254/63 82 Linux swap
Destination disk Drive Ox81, BIOS: Extensions Present
Interrupt 13 bios 1022/254/63 (max cyl/hd values)
Interrupt 13 ext 01023/255/63 (number of cyl/hd)
17938985 total number of sectors reported via interrupt 13 from the
BIOS
N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 000000063 001140552 0000/001/01 0070/254/63 06 Fat16
2 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
3 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
4 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
dd_copy (copy)
Command: dd if=/dev/da0s1 of=/dev/da1s1 bs=512
1140553+0 records in
1140552+0 records out
583962624 bytes transferred in 267.435125 secs (2183567 bytes/sec)
=== Error messages ===
dd: /dev/da1s1: end of device
==== Measurement Log s====
Sectors Compared 1140552
Sectors Differ 0
Diffs range:
Source (1236942) has 96390 more sectors than destination (1140552)
Hash after test: 0F9DACDA6C63D197C048782003D324108CEC7AB0
Expected
Results:
Source disk is unchanged
src compares qualified equal to dst, src is truncated on dst
truncation is logged
Actual
Results:
No anomalies
Analysis:
Expected results achieved
```

### Case DI(Linux)-13 for FreeBSD 4.4 dd

**Case Summary:** Copy a LINUX IDE source disk to a LINUX SCSI destination disk where the source disk is smaller than the destination

**Tester Name:** JRL

**Test Date:** Wed Oct 23 08:00:55 2002

**PC:** McMillian

**Disks:**

Source: DOS Drive 80 Physical Label F6
Destination: DOS Drive 81 Physical Label CC
Image media: DOS Drive 80 Physical Label 71
F6 is an IBM-DTAL-307020 with 40188960 sectors
CC is a SEAGATE ST336705LC with 71687370 sectors
71 is an IC35L040AVER07-0 with 80418240 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

**Source disk setup:**

Windows 2000 with NTFS & Fat32
Disk: F6
Host: Wimsey
Operator: JRL
OS: Windows 2000
Date: Sat Jul 21 15:53:12 2001

**Destination Setup:**

Z:\ss\DISKWIPE.EXE 13 McMillian 81 CC /noask /dst /new_log /comment JRL

**Execute:**

Boot to DOS
Z:\ss\DISKWIPE.EXE 13 McMillian 81 CC /noask /dst /new_log /comment JRL
Boot to FreeBSD
dd_copy (copy)
Command: dd if=/dev/ad3 of=/dev/da0 bs=512
Shutdown FreeBSD, Boot to DOS
Z:\ss\DISKCOMP.EXE 13 McMillian 80 F6 81 CC /new_log /comment JRL
Z:\ss\DISKHASH.EXE 13 JudgeDee 80 /comment F6(JRL) /new_log /after

**Log files loc:** test-archive/dd/freebsd-4.4/13
Log File

Highlights: Command: dd if=/dev/ad1 of=/dev/da0 bs=512
40188960+0 records in
40188960+0 records out
2057674520 bytes transferred in 5914.794439 secs (3478861 bytes/sec)
--- Error messages ---
no message
- - - - Measurement Logs - - - -
Sectors Compared 40188960
Sectors Differ 0
Diffs range
Source (40188960) has 31498410 fewer sectors than destination (71687370)
Zero fill: 0
Src Byte fill (F6): 0
Dst Byte fill (CC): 31498410
Other fill: 0
Other no fill: 0
Hash after test: 8034683D5D55BA51409AC7B5CB0845CA2CF6B235

Expected Results:
Source disk is unchanged
src compares qualified equal to dst

Actual Results:
No anomalies

Analysis: Expected results achieved

Case DI(Linux)-14 for FreeBSD 4.4 dd

Case Summary: Copy a LINUX IDE source disk to a LINUX SCSI destination disk where the source disk is larger than the destination

Tester Name: SN
Test Date: Mon Oct 21 14:36:30 2002
PC: McCloud

Disks: Source: DOS Drive 80 Physical Label A5
Destination: DOS Drive 81 Physical Label 13
Image media: DOS Drive 80 Physical Label 93
A5 is a WDC WD200BB-00AUA1 with 39102336 sectors
13 is a FUJITSU MAN3184MC with 35885447 sectors
93 is a WDC WD300BB-00CAAO with 58633344 sectors

Source disk setup:
Fat32 only
Disk: A5
Host: JudgeDee
Operator: JRL
OS: NoOs
Options: none
Date: Mon Apr 15 14:35:04 2002

cmd: Z:\ss\DISKWIPE.EXE A5 JudgeDee 80 A5 /src /new_log
X:\pm\pqmagic /cmd=X:\pm\f32-src.txt
No OS loaded, FAT32 partition only

cmd: Z:\ss\DISKHASH.EXE A5 JudgeDee 80 /before /new_log

Disk hash = 3DE5C01B5B37EA3E6CF9B25EB84F5D00FD14

Destination Setup:
Z:\ss\DISKWIPE.EXE 14 Wimsey 80 A5 81 13 /new_log /comment SN

Execute:
Boot to DOS
Z:\ss\DISKWIPE.EXE 14 McCloud 81 13 /noask /dst /new_log /comment SN
Boot to FreeBSD
dd_copy (copy)
dd if=/dev/ad1 of=/dev/da0 bs=512
end of device
Shutdown FreeBSD, Boot to DOS
Z:\ss\DISKCMP.EXE 14 Wimsey 80 A5 81 13 /new_log /comment SN
Z:\ss\DISKHASH.EXE 14 Wimsey 80 /comment A5(SN) /new_log /after

Log files loc: /test-archive/dd/freebsd-4.4/14

Log File

Highlights: Command: dd if=/dev/ad1 of=/dev/da0 bs=512
35885449+0 records in
35885448+0 records out
183733936 bytes transferred in 5352.035418 secs (3432965 bytes/sec)
--- Error messages ---
dd: /dev/da0: end of device
- - - - Measurement Logs - - - -

Sectors Compared 35885448
Sectors Differ 0
Diffs range
Source (39102336) has 3216888 more sectors than destination (35885448)

Hash after test: 3DE5C01B5BB37EA3E6CF9BC25EB84F5D00FD14

Expected Results:
Source disk is unchanged
src compares qualified equal to dst, src is truncated on dst
truncation is logged

Actual Results:
No anomalies

Analysis:
Expected results achieved

---

Case DI(Linux)-15 for FreeBSD 4.4 dd

Case Summary:
Copy a LINUX SCSI source disk
to a LINUX IDE destination disk
where the source disk is smaller than the destination

Tester Name: JRL
Test Date: Tue Oct 22 17:33:18 2002
PC: Cadfael

Disks:
Source: DOS Drive 80 Physical Label E3
Destination: DOS Drive 81 Physical Label F7
Image media: DOS Drive 80 Physical Label 20
E3 is a QUANTUM ATLAS10K2-TY092J with 17938985 sectors
F7 is an IBM-DTLA-307620 with 40188960 sectors
20 is an SEAGATE ST373405LC with 143374740 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup:
Dual boot Linux/Windows Me with EXT2 & Fat16
Disk: E3
Host: Cadfael
Operator: JRL
OS: Linux Red Hat 7.1/Windows Me
Date: Sat Jul 21 16:17:29 2001

DISKWIPE.EXE E3_SRC Rumpole 80 E3 /src /new_log
X:\pm\pqmagic /cmd=X:\pm\fat-src.txt
Load Operating System to Source disk
DISKHASH.EXE E3_SRC Rumpole 80 /before
Disk hash = 0F9DACDA6C63D197C048782003D324108CEC7AB0

Destination Setup:
Z:\ss\DISKWIPE.EXE 15 Cadfael 81 F7 /noask /dst /new_log /comment JRL

Execute:
Boot to DOS
Z:\ss\DISKWIPE.EXE 15 Cadfael 81 F7 /noask /dst /new_log /comment JRL
Boot to FreeBSD
dd_copy (copy)
dd if=/dev/da1 of=/dev/ad0 bs=512
Shutdown FreeBSD, Boot to DOS
Z:\ss\DISKCMPE.EXE 15 Wimsey 81 E3 80 F7 /new_log /comment JRL
Z:\ss\DISKHASH.EXE 15 Wimsey 80 /comment E3(JRL) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4/15

Log File Highlights:
Command: dd if=/dev/da1 of=/dev/ad0 bs=512
17938985+0 records in
17938985+0 records out
9184760320 bytes transferred in 3447.427583 secs (2664236 bytes/sec)
--- Error messages ---
no message
--- Measurement Logs ---
Sectors Compared 17938985
Sectors Differ 0
Diffs range
Source (17938985) has 22249975 fewer sectors than destination
(40188960)
Zero fill: 0
Src Byte fill (E3): 0
Dst Byte fill (F7): 22249975
Other fill: 0
Other no fill: 0
Hash after test: 0F9DACDA6C63D197C048782003D324108CEC7AB0

Expected Results:
Source disk is unchanged
src compares qualified equal to dst

---

34 of 57
### Case DI(Linux)-16 for FreeBSD 4.4 dd

**Case Summary:** Copy a LINUX SCSI source disk to a LINUX IDE destination disk where the source disk is larger than the destination

**Tester Name:** SN  
**Test Date:** Fri Nov 01 11:59:21 2002  
**PC:** HecRamsey

**Disks:**
- **Source:** DOS Drive 80 Physical Label E3  
- **Destination:** DOS Drive 81 Physical Label 63  
- **Image media:** DOS Drive 80 Physical Label 71  
- E3 is a QUANTUM ATLAS10K2-TY092J with 17938985 sectors  
- 63 is a WDCWD64AA with 12594960 sectors  
- 71 is a IC35L040AVER07-0 with 80418240 sectors  
- Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts  
- CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

**Source disk setup:**
- Dual boot Linux/Windows Me with EXT2 & Fat16  
- Disk: E3  
- Host: Cadfael  
- Operator: JRL  
- OS: Linux Red Hat 7.1/Windows Me  
- Date: Sat Jul 21 16:17:29 2001

**DISKWIPE.EXE**
- E3_SRC Rumpole 80 E3 /src /new_log  
- X:\pm\pqmagic /cmd=X:\pm\fat-src.txt  
- Load Operating System to Source disk  
- DISKHASH.EXE E3_SRC Rumpole 80 /before

**Destination Setup:**
- Z:\\ss\DISKWIPE.EXE 16 HecRamsey 81 63 /noask /dst /new_log /comment SN

**Execute:**
- Boot to DOS  
- Z:\\ss\DISKWIPE.EXE 16 HecRamsey 81 63 /noask /dst /new_log /comment SN  
- Boot to FreeBSD  
- dd_copy (copy)  
- dd if=/dev/da0 of=/dev/ad3 bs=512  
- end of device  
- Shutdown FreeBSD, Boot to DOS  
- Z:\\ss\DISKCOMP.EXE 16 HecRamsey 81 80 63 /new_log /comment SN  
- Z:\\ss\DISKHASH.EXE 16 HecRamsey 80 /comment E3(SN) /new_log /after

**Log files loc:** test-archive/dd/freebsd-4.4/16

**Log File Highlights:**
- dd_copy (copy)  
- Command: dd if=/dev/da0 of=/dev/ad3 bs=512  
- 12594961+0 records in  
- 12594960+0 records out  
- 644819520 bytes transferred in 21999.56397 secs (293125 bytes/sec)  
- --- Error messages ---  
- dd: /dev/ad3: end of device  
- --- Measurement Logs ---  
- Sectors Compared 12594960  
- Sectors Differ 0  
- Diffs range  
- Source (17938985) has 5344025 more sectors than destination (12594960)  
- Hash after test: 0F9DACA6C63D197C048782003D324108CEC7AB0

**Expected Results:** Source disk is unchanged  
src compares qualified equal to dst, src is truncated on dst truncation is logged

**Actual Results:** No anomalies  
Analysis: Expected results achieved

---

### Case DI(Linux)-18 for FreeBSD 4.4 dd

**Case Summary:** Create an image from a LINUX IDE source disk to a LINUX IDE destination disk where the source disk is smaller than the destination

**Tester Name:** JRL  
**Test Date:** Thu Jan 09 19:12:18 2003  
**PC:** Wimsey

**Disks:**
- Source: DOS Drive 80 Physical Label F6

---

**Log File Highlights:**
- dd_copy (copy)  
- Command: dd if=/dev/da0 of=/dev/ad3 bs=512  
- 12594961+0 records in  
- 12594960+0 records out  
- 644819520 bytes transferred in 21999.56397 secs (293125 bytes/sec)  
- --- Error messages ---  
- dd: /dev/ad3: end of device  
- --- Measurement Logs ---  
- Sectors Compared 12594960  
- Sectors Differ 0  
- Diffs range  
- Source (17938985) has 5344025 more sectors than destination (12594960)  
- Hash after test: 0F9DACA6C63D197C048782003D324108CEC7AB0

**Expected Results:** Source disk is unchanged  
src compares qualified equal to dst, src is truncated on dst truncation is logged

**Actual Results:** No anomalies  
Analysis: Expected results achieved
Destination: DOS Drive 81 Physical Label 90
Image media: DOS Drive 80 Physical Label 7A
F6 is an IBM-DTLA-30702 with 40188960 sectors
90 is a WD C WD300BB-00CAA0 with 58633344 sectors
7A is a MAXTOR 6L040J2 with 7817792 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FSTST Release 1.0

Source disk setup:
Windows 2000 with NTFS & Fat32
Disk: F6
Host: Wimsey
Operator: JRL
OS: Windows 2000
Date: Sat Jul 21 15:53:12 2001
DISKWIPE.EXE F6_SRC Wimsey 80 F6 /src /new_log /noask /comment Windows 2000/NT source
X:\pm\pgmagic /cmd=X:\pm\nt-src.txt
Load Operating System to Source disk
DISKHASH.EXE LX-27 Morse 80 /before
Disk hash = 8034683D5D55BA51409AC7B5CB0845CA2CF68235

Destination Setup:
Z:\ss\DISKWIPE.EXE 18 Wimsey 81 90 /noask /dst /new_log /comment JRL

Execute:
Boot to DOS
Z:\ss\DISKWIPE.EXE 18 Wimsey 81 90 /noask /dst /new_log /comment JRL
Boot to FreeBSD
dd_image ad1 ad3 18
(backup to image)
(dd if=/dev/ad1 skip=0 count=1000000 bs=512 | gzip ...)
(dd if=/dev/ad1 skip=1000000 count=1000000 bs=512 | gzip ...)
(dd if=/dev/ad1 skip=2000000 count=1000000 bs=512 | gzip ...)... (restore from image)...
(gunzip ... dd of=/dev/ad3 seek=39000000 count=1000000 bs=512 ...) (gunzip ... dd of=/dev/ad3 seek=40000000 count=1000000 bs=512 ...) (gunzip ... dd of=/dev/ad3 seek=41000000 count=1000000 bs=512 ...) Shutdown FreeBSD, Boot to DOS
Z:\ss\DISKWIPE.EXE 18 Wimsey 80 F6 81 90 /new_log /comment JRL
Z:\ss\DISKHASH.EXE 18 Wimsey 80 /comment F6(JRL) /new_log /after

Log files loc: Test-archive/dd/freebsd-4.4/18
Log File
dd_image ad1 ad3 18
(backup to image)
dk-backup /dev/ad1 18
Sat Jan 11 02:15:31 EST 2003
(dd if=/dev/ad1 skip=0 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out51200000 bytes transferred in 130.180153 secs (3933011 bytes/sec)
(dd if=/dev/ad1 skip=1000000 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out51200000 bytes transferred in 130.353574 secs (3927779 bytes/sec)
... (restore from image)...
51200000 bytes transferred in 121.092793 secs (4228162 bytes/sec ...)
(gunzip ... dd of=/dev/ad3 seek=40000000 count=1000000 bs=512 ...)188960+0 records in
188960+0 records out96747520 bytes transferred in 24.592533 secs (3934020 bytes/sec ...)
(gunzip ... dd of=/dev/ad3 seek=41000000 count=1000000 bs=512 ...)0+0 records in
0+0 records out0 bytes transferred in 0.016688 secs (0 bytes/sec ...)
Finish at Sat Jan 11 04:38:54 EST 2003
=== Error messages ===
no message
==== Measurement Log s====
Sectors Compared 40188960
Sectors Differ 0
Diffs range
Source (40188960) has 18444384 fewer sectors than destination (58633344)
Zero fill: 0  
Src Byte fill (F6): 0  
Dst Byte fill (90): 18444384  
Other fill: 0  
Other no fill: 0  
Hash after test: 8034683D5D55BA51409AC7B5CB0B845CA2CF6B235

| Expected Results: | Source disk is unchanged  
src compares qualified equal to dst |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Results:</td>
<td>No anomalies</td>
</tr>
<tr>
<td>Analysis:</td>
<td>Expected results achieved</td>
</tr>
</tbody>
</table>

**Case DI(Linux)-20 for FreeBSD 4.4 dd**

<table>
<thead>
<tr>
<th>Case Summary:</th>
<th>Create an image from a LINUX IDE source disk to a LINUX IDE destination disk where the source disk is the same size as the destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tester Name:</td>
<td>JRL</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Thu Jan 09 18:55:14 2003</td>
</tr>
<tr>
<td>PC:</td>
<td>Cadfael</td>
</tr>
</tbody>
</table>
| Disks:        | Source: DOS Drive 80 Physical Label F5  
Destination: DOS Drive 81 Physical Label F7  
Image media: DOS Drive 80 Physical Label 93  
F5 is an IBM-DTLA-307020 with 40188960 sectors  
F7 is an IBM-DTLA-307020 with 40188960 sectors  
93 is a WDC WD300BB-00CAA0 with 58633344 sectors  
| Source disk setup: | Dual boot Linux/Windows Me with EXT2 & Fat16  
Disk: F5  
Host: Cadfael  
Operator: JRL  
OS: WindowsMe/Linux  
Date: Sat Aug 11 11:13:43 2001  
DISKWIPE.EXE F5_SRC Cadfael 80 F5 /src  
X:\pm\pmagic /cmd=X:\pm\fat-src.txt  
Load Operating System to Source disk  
DISKHASH.EXE F5_SRC Cadfael 80 /before  
Disk hash = 83A0002816BBF089F8BE33C41C92C385A0F42A54 |
| Destination Setup: | Z:\ss\DISKWIPE.EXE 20 Cadfael 81 F7 /noask /dst /new_log /comment JRL |
| Execute: | Boot to DOS  
Z:\ss\DISKWIPE.EXE 20 Cadfael 81 F7 /noask /dst /new_log /comment JRL  
Boot to FreeBSD  
dd_image ad1 ad3 20  
(backup to image)  
(dd if=/dev/ad1 skip=0 count=1000000 bs=512 | gzip ...)  
(dd if=/dev/ad1 skip=1000000 count=1000000 bs=512 | gzip ...)  
(dd if=/dev/ad1 skip=2000000 count=1000000 bs=512 | gzip ...)  
... (restore from image)  
... (gunzip ... dd of=/dev/ad3 seek=39000000 count=1000000 bs=512 ...)  
(gunzip ... dd of=/dev/ad3 seek=40000000 count=1000000 bs=512 ...)  
(gunzip ... dd of=/dev/ad3 seek=41000000 count=1000000 bs=512 ...)  
Shutdown FreeBSD, Boot to DOS  
Z:\ss\DISKCOMP.EXE 20 Cadfael 80 F5 81 F7 /new_log /comment JRL  
Z:\ss\DISKHASH.EXE 20 Cadfael 80 /comment F5(JRL) /new_log /after  
Z:\ss\DISKWIPE.EXE 20 Cadfael 81 F7 /noask /dst /new_log /comment JRL  
Boot to FreeBSD  
dd_image ad1 ad3 20  
(backup to image)  
dk-backup /dev/ad1 20  
Fri Jan 10 20:53:43 EST 2003  
(dd if=/dev/ad1 skip=0 count=1000000 bs=512 | gzip ...)  
1000000+0 records in  
1000000+0 records out  
512000000 bytes transferred in 143.896231 secs (3558120 bytes/sec)  
(dd if=/dev/ad1 skip=1000000 count=1000000 bs=512 | gzip ...)  
1000000+0 records in  
1000000+0 records out  
512000000 bytes transferred in 119.230509 secs (4294203 bytes/sec)  
... |

Log files loc: Test-archive/dd/freebsd-4.4/20

Log File Highlights: dd_image ad1 ad3 20  
(backup to image)  
dk-backup /dev/ad1 20  
 Fri Jan 10 20:53:43 EST 2003  
(dd if=/dev/ad1 skip=0 count=1000000 bs=512 | gzip ...)  
1000000+0 records in  
1000000+0 records out  
512000000 bytes transferred in 143.896231 secs (3558120 bytes/sec)  
(dd if=/dev/ad1 skip=1000000 count=1000000 bs=512 | gzip ...)  
1000000+0 records in  
1000000+0 records out  
512000000 bytes transferred in 119.230509 secs (4294203 bytes/sec)  
...
Case DI(Linux)-21 for FreeBSD 4.4 dd

Case Summary: Create an image from a LINUX IDE source disk to a LINUX IDE destination disk where the source disk is larger than the destination

Tester Name: SN
Test Date: Mon Jan 13 21:44:41 2003
PC: McCloud
Disks:

Source disk setup:
- Disk: F5
- Host: Cadfael
- Operator: JRL
- OS: WindowsMe/Linux
- Date: Sat Aug 11 11:13:43 2001
- DISKWIPE.EXE F5_SRC Cadfael 80 F5 /src
- X:\pm\pqmagic /cmd=X:\pm\fat-src.txt
- Load Operating System to Source disk
- DISKHASH.EXE F5_SRC Cadfael 80 /before
- Disk hash = 83A0002816BBF089F8BE33C41C92C3B5A0F42A54

Destination Setup:
- Z:\ss\DISKWIPE.EXE 21 McCloud 81 A8 /noask /dst /new_log /comment SN

Execute:
- Boot to DOS
Z:\ss\DISKWIPE.EXE 21 McCloud 81 A8 /noask /dst /new_log /comment SN
- Boot to FreeBSD
dd_image ad1 ad3 21 (backup to image)
(dd if=/dev/ad1 skip=0 count=1000000 bs=512 | gzip ...)
(dd if=/dev/ad1 skip=1000000 count=1000000 bs=512 | gzip ...)
(dd if=/dev/ad1 skip=2000000 count=1000000 bs=512 | gzip ...)
(...
(restore from image)
(...
(gunzip ... dd of=/dev/ad3 seek=39000000 count=1000000 bs=512 ...)
(gunzip ... dd of=/dev/ad3 seek=40000000 count=1000000 bs=512 ...)
(gunzip ... dd of=/dev/ad3 seek=41000000 count=1000000 bs=512 ...)
- Shutdown FreeBSD, Boot to DOS
Z:\ss\DISKCOMP.EXE 21 McCloud 80 F5 81 A8 /new_log /comment SN
Z:\ss\DISKHASH.EXE 21 McCloud 80 /comment F5(SN) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4/21

Expected Results:
- Source disk is unchanged
- src compares equal to dst

Actual Results:
- No anomalies

Analysis:
- Expected results achieved
Log File

Highlights:

```
dd_image ad1 ad3 21
(dd if=/dev/ad1 skip=0 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 145.526005 secs (3518272 bytes/sec)
(dd if=/dev/ad1 skip=1000000 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 118.978436 secs (4303301 bytes/sec)
```

(restore from image)

```
(gunzip ... dd of=/dev/ad3 seek=40000000 count=1000000 bs=512 ...) dd: /dev/ad3: Invalid argument
1+0 records in
0+0 records out
0 bytes transferred in 0.019907 secs (0 bytes/sec ...)
```

Expected Results:

Source disk is unchanged
src compares qualified equal to dst, src is truncated on dst truncation is logged

Actual Results:

No anomalies

Analysis:

Expected results achieved

---

**Case DI(Linux)-23 for FreeBSD 4.4 dd**

**Case Summary:** Create an image from a LINUX IDE source disk to a LINUX IDE destination disk and the source contains a LINUX partition where the source disk is smaller than the destination

**Tester Name:** JRL

**Test Date:** Thu Nov 07 13:41:24 2002

**PC:** HecRamsey

**Disks:**

Source: DOS Drive 80 Physical Label F5
Destination: DOS Drive 81 Physical Label F7
Image media: DOS Drive 80 Physical Label 71
F5 is an IBM-DTLA-307020 with 40188960 sectors
F7 is an IBM-DTLA-307020 with 40188960 sectors
71 is an IC35L040AVER07-0 with 80418240 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

**Source disk setup:**

Dual boot Linux/Windows Me with EXT2 & Fat16
Disk: F5
Host: Cadfael
Operator: JRL
OS: WindowsMe/Linux
Date: Sat Aug 11 11:13:43 2001

```
DISKWIPE.EXE F5_SRC Cadfael 80 F5 /src
X:\pm\pqmagic /cmd=X:\pm\fat-src.txt
Load Operating System to Source disk
DISKHASH.EXE F5_SRC Cadfael 80 /before
```

Disk hash = 83A0002816BBF089FBE33C41C92C3B5A0F42A54

**Destination Setup:**

Z:\ss\DISKWIPE.EXE 23 HecRamsey 81 F7 /noask /dst /new_log /comment JRL

**Execute:**

```
Z:\ss\DISKWIPE.EXE 23 HecRamsey 81 F7 /noask /dst /new_log /comment JRL
```
A:\SECHASH.EXE 23 HecRamsey 81 /new_log /log prehash.txt /first 7389900

Boot to FreeBSD

dd_image ad1s3 ad3s2 23
(backup to image)
(dd if=/dev/ad1s3 skip=0 count=1000000 bs=512 | gzip ...)
(dd if=/dev/ad1s3 skip=1000000 count=1000000 bs=512 | gzip ...)
(dd if=/dev/ad1s3 skip=2000000 count=1000000 bs=512 | gzip ...)
...
(restore from image)
...
(gunzip ... dd of=/dev/ad3s2 seek=5000000 count=1000000 bs=512 ...)
(gunzip ... dd of=/dev/ad3s2 seek=6000000 count=1000000 bs=512 ...)
(gunzip ... dd of=/dev/ad3s2 seek=7000000 count=1000000 bs=512 ...)
A:\SECHASH.EXE 23 HecRamsey 81 /new_log /log posthash.txt /first 7389900 /last 7598744

Shutdown FreeBSD, Boot to DOS

Z:\ss\PARTCMP.EXE 23 HecRamsey 80 F5 81 F7 /new_log /comment JRL /select 9 2

Z:\ss\DISKHASH.EXE 23 Wimsey 80 /comment F5(JRL) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4/23

Log File

Source disk Drive 0x80, BIOS: Extensions Present
Interrupt 13 bios 1022/254/63 (max cyl/hd values)
Interrupt 13 ext 16383/016/63 (number of cyl/hd)
40188960 total number of sectors reported via interrupt 13 from the BIOS

N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 000000063 001236942 0000/001/01 0076/254/63 Boot 06 Fat16
2 X 002249100 007181055 0140/000/01 0586/254/63 05 extended
3 S 000000063 00208782 0153/000/01 0152/254/63 83 Linux
4 X 000208845 00144585 0153/000/01 0152/254/63 05 extended
5 S 000000063 00144522 0153/000/01 0152/254/63 06 Fat16
6 X 004450005 00192780 0417/000/01 0428/254/63 05 extended
7 S 000000063 00192717 0417/000/01 0428/254/63 16 other
8 S 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
9 P 009430155 001652895 0587/000/01 0969/254/63 83 Linux
10 P 039760875 000417690 1023/000/01 1023/254/63 82 Linux swap

Destination disk Drive 0x81, BIOS: Extensions Present
Interrupt 13 bios 1022/254/63 (max cyl/hd values)
Interrupt 13 ext 16383/016/63 (number of cyl/hd)
40188960 total number of sectors reported via interrupt 13 from the BIOS

N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 000000063 001236942 0000/001/01 0076/254/63 06 Fat16
2 P 001237005 006361740 0077/000/01 0472/254/63 83 Linux
3 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
4 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
5 P 004450005 00192780 0417/000/01 0428/254/63 16 other
6 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
7 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
8 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
9 P 009430155 001652895 0587/000/01 0969/254/63 83 Linux
10 P 039760875 000417690 1023/000/01 1023/254/63 82 Linux swap

dd_image ad1s3 ad3s2 23
(backup to image)
dk-backup /dev/ad1s3 23
Thu Nov 7 15:50:08 EST 2002
(dd if=/dev/ad1s3 skip=0 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 140.640783 secs (3640480 bytes/sec)
(dd if=/dev/ad1s3 skip=1000000 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 129.676448 secs (3948288 bytes/sec)

(restore from image)
...
512000000 bytes transferred in 147.864715 secs (3462625 bytes/sec ...)
(gunzip ... dd of=/dev/ad3s2 seek=6000000 count=1000000 bs=512 ...)
152895+0 records in
152895+0 records out
78282240 bytes transferred in 22.470647 secs (3483756 bytes/sec ...)
(gunzip ... dd of=/dev/ad1s3 seek=7000000 count=1000000 bs=512 ...)
0+0 records in
0+0 records out
0 bytes transferred in 0.000016 secs (0 bytes/sec ...)
Finish at Thu Nov 7 16:18:43 EST 2002
--- Error messages ---
no message
--- Measurement Logs ---

- Sectors Compared: 6152895
- Sectors Differ: 0
- Diffs range:
  - Source (6152895) has 208845 fewer sectors than destination (6361740)
  - Zero fill: 6694
  - Src Byte fill (F5): 0
  - Dst Byte fill (F7): 201773
  - Other fill: 14
  - Other no fill: 364

- Excess Sectors Hashes:
  - Before dd: 85D571DACS34ED608724FACFC5865AA55126663F
  - After dd: 85D571DACS34ED608724FACFC5865AA55126663F

- Hash after test: 83A0002816BBF089F8BE35C492C3B5A0F42A54

Expected Results:
- Source disk is unchanged
- src compares qualified equal to dst

Actual Results:
- No anomalies

Analysis:
- Expected results achieved

--- Case DI(Linux)-27 for FreeBSD 4.4 dd ---

Case Summary:
- Create an image from a LINUX IDE source disk to a LINUX IDE destination disk
- and the source contains a FAT32 partition
- where the source disk is the same size as the destination

Tester Name: JRL
Test Date: Tue Oct 22 17:42:42 2002
PC: HecRamsey

Disks:
- Source: DOS Drive 80 Physical Label A5
- Destination: DOS Drive 81 Physical Label A8
- Image media: DOS Drive 80 Physical Label 93
- A5 is a WDC WD200BB-00AUA1 with 39102336 sectors
- A8 is a WDC WD200BB-00AUA1 with 39102336 sectors
- 93 is a WDC WD300BB-00CAA0 with 58633344 sectors
- Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
- CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup:
- Fat32 only
- Disk: A5
- Host: JudgeDee
- Operator: JRL
- OS: NoOs
- Options: none
- Date: Mon Apr 15 14:35:04 2002

```cmd
Z:\ss\DISKWIPE.EXE A5 JudgeDee 80 A5 /src /new_log
X:\pm\pqmagic /cmd=X:\pm\f32-src.txt
No OS loaded, FAT32 partition only
```

```cmd
Z:\ss\DISKHASH.EXE A5 JudgeDee 80 /comment A5(JRL) /new_log /after
```

Destination Setup:
Z:\\ss\DISKWIPE.EXE 27 HecRamsey 81 A8 /noask /dst /new_log /comment JRL

Execute:
- Boot to DOS
- Z:\\ss\DISKWIPE.EXE 27 HecRamsey 81 A8 /noask /dst /new_log /comment JRL
- Boot to FreeBSD
- dd_image ad1s1 ad3s1 27 (backup to image)
- (dd if=/dev/ad1s1 skip=0 count=1000000 bs=512 | gzip ...)
- (dd if=/dev/ad1s1 skip=1000000 count=1000000 bs=512 | gzip ...)
- (dd if=/dev/ad1s1 skip=2000000 count=1000000 bs=512 | gzip ...)
- (restore from image)
- (gunzip ... dd of=/dev/ad3s1 seek=0 count=1000000 bs=512 ...)
- (gunzip ... dd of=/dev/ad3s1 seek=1000000 count=1000000 bs=512 ...)
- Shutdown FreeBSD, Boot to DOS
- Z:\\ss\PARTCMP.EXE 27 HecRamsey 80 A5 81 A8 /new_log /comment JRL /select 1 1
- Z:\\ss\DISKHASH.EXE 27 HecRamsey 80 /comment A5(JRL) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4.27
Log File Highlights:
- Source disk Drive 0x80, BIOS: Extensions Present
- Interrupt 13 bios 1022/254/63 (max cyl/hd values)
<table>
<thead>
<tr>
<th>N Start LBA</th>
<th>Length</th>
<th>Start C/H/S</th>
<th>End C/H/S</th>
<th>Boot Partition type</th>
<th>Boot</th>
<th>BIOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 P</td>
<td>0000000063</td>
<td>001236942</td>
<td>0000/001/01</td>
<td>0076/254/63</td>
<td>0B</td>
<td>Fat32</td>
</tr>
<tr>
<td>2 X</td>
<td>001429785</td>
<td>037061955</td>
<td>0089/000/001/0</td>
<td>1023/254/63</td>
<td>0F</td>
<td>extended</td>
</tr>
<tr>
<td>3 S</td>
<td>0000000063</td>
<td>00208782</td>
<td>0089/000/001/0</td>
<td>1021/254/63</td>
<td>83</td>
<td>Linux</td>
</tr>
<tr>
<td>4 X</td>
<td>00208845</td>
<td>00144585</td>
<td>0102/000/001/0</td>
<td>0110/254/63</td>
<td>05</td>
<td>extended</td>
</tr>
<tr>
<td>5 S</td>
<td>0000000063</td>
<td>00144522</td>
<td>0102/000/001/0</td>
<td>0110/254/63</td>
<td>0B</td>
<td>Fat32</td>
</tr>
<tr>
<td>6 X</td>
<td>000771120</td>
<td>000192780</td>
<td>0108/000/001/0</td>
<td>1023/254/63</td>
<td>0F</td>
<td>extended</td>
</tr>
<tr>
<td>7 S</td>
<td>0000000063</td>
<td>00192717</td>
<td>0108/000/001/0</td>
<td>1024/254/63</td>
<td>16</td>
<td>other</td>
</tr>
<tr>
<td>8 S</td>
<td>0000000000</td>
<td>0000000000</td>
<td>0000/000/000/00</td>
<td>0000/000/000/00</td>
<td>00</td>
<td>empty entry</td>
</tr>
<tr>
<td>9 P</td>
<td>003883740</td>
<td>00404260</td>
<td>1023/000/01</td>
<td>1023/254/63 83 Linux</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 P</td>
<td>0038684520</td>
<td>00417690</td>
<td>1023/000/01</td>
<td>1023/254/63 82 Linux swap</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Destination disk Drive 0x81, BIOS: Extensions Present

Interrupt 13 bios 1022/254/63 (max cyl/hd values)
Interrupt 13 ext 16383/016/63 (number of cyl/hd)

Case DI(Linux)-30 for FreeBSD 4.4 dd

Case Summary: Create an image from a LINUX IDE source disk to a LINUX IDE destination disk and the source contains a FAT32 partition where the source disk is larger than the destination

Tester Name: JRL
Test Date: Wed Oct 23 07:48:08 2002
PC: HecRamsey
Disks:
Source: DOS Drive 80 Physical Label A5
Destination: DOS Drive 81 Physical Label A8
Image media: DOS Drive 80 Physical Label 93

| Source disk is unchanged | src compares equal to dst | No anomalies | Expected results achieved |
A5 is a WDC WD200BB-00AUA1 with 39102336 sectors
A8 is a WDC WD200BB-00AUA1 with 39102336 sectors
93 is a WDC WD300BB-00CA0A with 58633344 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup:
Fat32 only
Disk: A5
Host: JudgeDee
OS: NoOos
Options: none
Date: Mon Apr 15 14:35:04 2002

cmd: Z:\ss\DISKWIPE.EXE A5 JudgeDee 80 A5 /src /new_log
X:\\p\mpmagic /cmd=X:\\p\f32-src.txt
No OS loaded, FAT32 partition only
cmd: Z:\ss\DISKHASH.EXE A5 JudgeDee 80 /before /new_log

Disk hash = 3DE5C01BB337EAE3E6CF9BC25EB844F5D00FD14

Destination setup:
Z:\ss\DISKWIPE.EXE 30 HecRamsey 81 A8 /noask /dst /new_log /comment JRL

Execute:
Boo to DOS
Z:\ss\DISKWIPE.EXE 30 HecRamsey 81 A8 /noask /dst /new_log /comment JRL
Boot to FreeBSD
dd_image ad1s1 ad3s1 30
   (backup to image)
   (dd if=/dev/ad1s1 skip=0 count=1000000 bs=512 | gzip ...)
   (dd if=/dev/ad1s1 skip=1000000 count=1000000 bs=512 | gzip ...)
   (dd if=/dev/ad1s1 skip=2000000 count=1000000 bs=512 | gzip ...)

   (restore from image)
   
   (gunzip ... dd of=/dev/ad3s1 seek=0 count=1000000 bs=512 ...)
   (gunzip ... dd of=/dev/ad3s1 seek=1000000 count=1000000 bs=512 ...)
   (gunzip ... dd of=/dev/ad3s1 seek=2000000 count=1000000 bs=512 ...)
Shutd Dow FreeBSD, Boot to DOS
Z:\ss\PARTCMP.EXE 30 HecRamsey 80 A5 81 A8 /new_log /comment JRL
   /select 1 1
Z:\ss\DISKHASH.EXE 30 Rumpole 80 /comment A5(JRL) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4/30

Log File
Source disk Drive 0x80, BIOS: Extensions Present
Interrupt 13 bios 1022/254/63 (max cyl/hd values)
Interrupt 13 ext 16383/016/63 (number of cyl/hd)
39102336 total number of sectors reported via interrupt 13 from the BIOS

N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 0000000063 001236942 0000/001/01 0076/254/63 Boot OB Fat32
2 X 0000000785 02761955 0089/000/01 1023/254/63 0F extended
3 S 0000000063 000208782 0089/001/01 0101/254/63 83 Linux
4 X 0000208845 000144585 0102/000/01 0110/254/63 05 extended
5 S 0000000063 000144522 0010/000/01 0110/254/63 0B Fat32
6 X 0000771120 000192780 0137/000/01 0148/254/63 05 extended
7 S 0000000063 000192717 0137/001/01 0148/254/63 16 other
8 S 0000000000 000000000 0000/000/00 0000/000/00 00 empty entry
9 P 038491740 000064260 1023/000/01 1023/254/63 83 Linux
10 P 038684520 000417690 1023/000/01 1023/254/63 82 Linux swap

Destination disk Drive 0x81, BIOS: Extensions Present
Interrupt 13 bios 1022/254/63 (max cyl/hd values)
Interrupt 13 ext 16383/016/63 (number of cyl/hd)
39102336 total number of sectors reported via interrupt 13 from the BIOS

N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 0000000063 001236942 0000/001/01 0076/254/63 Boot OB Fat32
2 P 0000000000 000000000 0000/000/00 0000/000/00 00 empty entry
3 P 0000000000 000000000 0000/000/00 0000/000/00 00 empty entry
4 P 0000000000 000000000 0000/000/00 0000/000/00 00 empty entry
dd_image ad1s1 ad3s1 30
   (backup to image)

dk-backup /dev/ad1s1 30
Wed Oct 23 08:31:54 EDT 2002
   (dd if=/dev/ad1s1 skip=0 count=1000000 bs=512 | gzip ...)
   1000000+0 records in
   1000000+0 records out
   512000000 bytes transferred in 122.628273 secs (4175220 bytes/sec)
Case DI(Linux)-33 for FreeBSD 4.4 dd

Case Summary: Create an image from a LINUX SCSI source disk to a LINUX SCSI destination disk where the source disk is smaller than the destination.

Tester Name: JRL
Test Date: Thu Jan 09 14:54:52 2003
PC: Wimsey

Disks:
Source: DOS Drive 80 Physical Label E4
Destination: DOS Drive 81 Physical Label E6
Image media: DOS Drive 80 Physical Label 7A
E4 is a QUANTUM ATLAS10K2-TY092J with 17938985 sectors
E6 is a SEAGATE ST318404LC with 35843670 sectors
7A is a MAXTOR 6L040J2 with 7817792 sectors

Source disk setup:
Windows 2000 with NTFS & Fat32
Disk: E4
Host: JudgeDee
Operator: JRL
OS: Windows 2000/NT
Date: Sat Jul 21 16:58:28 2001
DISKWIPE.EXE E4_SRC JudgeDee 80 E4 /noask /comment Windows 2000 source disk
X:\pm\pqmagic /cmd=X:\pm\nt-src.txt
Load Operating System to Source disk
cmd: X:\as\DISKHASH.EXE Hash Wimsey 80 /comment E4 /new_log /before
Disk hash = 25BF8AF6B2D3E0BD1909C96E368DB27F51C49CBF

Destination Setup:
Z:\as\DISKWIPE.EXE 33 Wimsey 81 E6 /noask /dst /new_log /comment JRL

Execute:
Boot to DOS
Z:\as\DISKWIPE.EXE 33 Wimsey 81 E6 /noask /dst /new_log /comment JRL
Boot to FreeBSD
dd_image da0 da1 33 (backup to image)
(dd if=/dev/da0 skip=0 count=1000000 bs=512 | gzip ...)
(dd if=/dev/da0 skip=1000000 count=1000000 bs=512 | gzip ...)
(dd if=/dev/da0 skip=2000000 count=1000000 bs=512 | gzip ...)
... (restore from image)
Shutdown FreeBSD, Boot to DOS

Z:\ss\DISKCOMP.EXE 33 Wimsey 80 E4 81 E6 /new_log /comment JRL
Z:\ss\DISKHASH.EXE 33 Wimsey 80 /comment E4(JRL) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4/33

Log File
Highlights:
(backup to image)
dk-backup /dev/da0 33
Thu Jan 9 15:28:41 EST 2003
(dd if=/dev/da0 skip=0 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 121.275246 secs (4221801 bytes/sec)
(dd if=/dev/da0 skip=1000000 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 113.978902 secs (4492059 bytes/sec)

(restore from image)
512000000 bytes transferred in 73.528287 secs (6963307 bytes/sec ...)
(gunzip ... dd of=/dev/da1 seek=17000000 count=1000000 bs=512 ...)
938985+0 records in
938985+0 records out
480760320 bytes transferred in 68.889754 secs (6978691 bytes/sec ...)
(gunzip ... dd of=/dev/da1 seek=18000000 count=1000000 bs=512 ...)
0+0 records in
0+0 records out
0 bytes transferred in 0.000019 secs (0 bytes/sec ...)
Finish at Thu Jan 9 16:16:03 EST 2003

== Error messages ==
no message

== Measurement Logs ==
Sectors Compared 17938985
Sectors Differ 0
Diffs range
Source (17938985) has 17904685 fewer sectors than destination
35843670
Zero fill: 0
Src Byte fill (E4): 0
Dst Byte fill (E6): 17904685
Other fill: 0
Other no fill: 0
Hash after test: 2BF8AF6B2D3E0BD1909C96E368DB27F51C49CBF

Expected Results: Source disk is unchanged
src compares qualified equal to dst

Actual Results: No anomalies

Analysis: Expected results achieved

Case DI(Linux)-35 for FreeBSD 4.4 dd

Case Summary: Create an image from a LINUX SCSI source disk
to a LINUX SCSI destination disk
where the source disk is the same size as the destination

Tester Name: JRL
Test Date: Tue Oct 22 16:11:35 2002
PC: Rumpole

Disks: Source: DOS Drive 80 Physical Label E4
Destination: DOS Drive 81 Physical Label E2
Image media: DOS Drive 80 Physical Label 71
E4 is a QUANTUM ATLAS10K2-TY092J with 17938985 sectors
E2 is a QUANTUM ATLAS10K2-TY092J with 17938985 sectors
71 is a IC35L040AVER07-0 with 80418240 sectors

Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup: Windows 2000 with NTFS & Fat32
Disk: E4
Host: JudgeDee
Operator: JRL
OS: Windows 2000/NT
Source disk

Load Operating System to Source disk
cmd: X:\ss\DISKWIPE.EXE E4 /src /noask /comment Windows 2000

Disk hash = 25BF8AF6B2D3E0BD1909C96E368DB27F51C49CBF

Destination
Setup:
Z:\ss\DISKWIPE.EXE 35 Rumpole 81 E2 /noask /dst /new_log /comment JRL

Execute:
Z:\ss\DISKWIPE.EXE 35 Rumpole 81 E2 /noask /dst /new_log /comment JRL
Boot to FreeBSD

熙熙image da0 da1 35
(backup to image)
(dd if=/dev/da0 skip=0 count=1000000 bs=512 | gzip ...)
(dd if=/dev/da0 skip=1000000 count=1000000 bs=512 | gzip ...)
(dd if=/dev/da0 skip=2000000 count=1000000 bs=512 | gzip ...)
...
(restore from image)
...
(gunzip ... dd of=/dev/da1 seek=16000000 count=1000000 bs=512 ...)
(gunzip ... dd of=/dev/da1 seek=17000000 count=1000000 bs=512 ...)
(gunzip ... dd of=/dev/da1 seek=18000000 count=1000000 bs=512 ...)
Shutdown FreeBSD, Boot to DOS

Z:\ss\DISKCMP.EXE 35 Rumpole 80 E4 81 E2 /new_log /comment JRL
Z:\ss\DISKHASH.EXE 35 Rumpole 80 /comment E4(JRL) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4/35
Log File
dd_image da0 da1 35
(backup to image)
dk-backup /dev/da0 35
Tue Oct 22 16:24:06 EDT 2002
(dd if=/dev/da0 skip=0 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 114.223701 secs (4482432 bytes/sec)
(dd if=/dev/da0 skip=1000000 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 114.223701 secs (4482432 bytes/sec)
...
(restore from image)
...
512000000 bytes transferred in 239.104556 secs (2141324 bytes/sec ...)
(gunzip ... dd of=/dev/da1 seek=17000000 count=1000000 bs=512 ...)
938985+0 records in
938985+0 records out
480760320 bytes transferred in 225.571918 secs (2131295 bytes/sec ...)
(gunzip ... dd of=/dev/da1 seek=18000000 count=1000000 bs=512 ...)
0+0 records in
0+0 records out
0 bytes transferred in 0.000018 secs (0 bytes/sec ...)
Finish at Tue Oct 22 17:58:14 EDT 2002

--- Error messages ---
no message
- - - - Measurement Logs - - - -
Sectors Compared 17938985
Sectors Differ 0
Diffs range
Hash after test: 25BF8AF6B2D3E0BD1909C96E368DB27F51C49CBF

Case DJ(Linux)-36 for FreeBSD 4.4 dd
Case Summary: Create an image from a LINUX SCSI source disk
to a LINUX SCSI destination disk
where the source disk is larger than the destination
Tester Name: SN
Test Date: Mon Oct 28 14:35:07 2002

Expected Results: Source disk is unchanged
src compares equal to dst
Actual Results: No anomalies
Analysis: Expected results achieved
**PC:** Wimsey

**Disks:**
- **Source:** DOS Drive 80 Physical Label E3
- **Destination:** DOS Drive 81 Physical Label EB
- **Image media:** DOS Drive 80 Physical Label 7A
  - E3 is a QUANTUM ATLAS10K2-TY092J with 17938985 sectors
  - EB is a SEAGATE ST39204LC with 17921835 sectors
  - 7A is a MAXTOR 6L040J2 with 78177792 sectors
- **Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts**
- **CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0**

**Source disk setup:**
- **Disk:** E3
- **Host:** Cadfael
- **Operator:** JRL
- **OS:** Linux Red Hat 7.1/Windows Me
- **Date:** Sat Jul 21 16:17:29 2001

**DISKWIPE.EXE**
- E3_SRC Rumpole 80 E3 /src /new_log
- X:\pm\pqmagic /cmd=X:\pm\fat-src.txt
- **Load Operating System to Source disk**
- DISKHASH.EXE E3_SRC Rumpole 80 /before
- **Disk hash = 0F9DACDA6C63D197C048782003D324108CEC7AB0**

**Destination Setup:**
- Z:\ss\DISKWIPE.EXE 36 Wimsey 81 EB /noask /dst /new_log /comment SN

**Execute:**
- Boot to DOS
  - Z:\ss\DISKWIPE.EXE 36 Wimsey 81 EB /noask /dst /new_log /comment SN
  - Boot to FreeBSD
  - dd_image da0 da1 36
    - (backup to image)
    - (dd if=/dev/da0 skip=0 count=1000000 bs=512 | gzip ...)
    - (dd if=/dev/da0 skip=1000000 count=1000000 bs=512 | gzip ...)
    - (dd if=/dev/da0 skip=2000000 count=1000000 bs=512 | gzip ...)
    - (restore from image)
    - (gunzip ... dd of=/dev/da1 seek=16000000 count=1000000 bs=512 ...)
    - (gunzip ... dd of=/dev/da1 seek=17000000 count=1000000 bs=512 ...)
    - (gunzip ... dd of=/dev/da1 seek=18000000 count=1000000 bs=512 ...)
    - Shutdown FreeBSD, Boot to DOS
  - Z:\ss\DISKCOMP.EXE 36 Wimsey 80 E3 81 EB /new_log /comment SN
  - Z:\ss\DISKHASH.EXE 36 Wimsey 80 /comment E3(SN) /new_log /after

**Log files loc:** test-archive/dd/freebsd-4.4/36

**Log File Highlights:**
- dd_image da0 dal 36
  - (backup to image)
- dk-backup /dev/da0 36
  - Mon Oct 28 14:58:01 EST 2002
  - (dd if=/dev/da0 skip=0 count=1000000 bs=512 | gzip ...)
  - 1000000+0 records in
  - 1000000+0 records out
  - 512000000 bytes transferred in 166.159637 secs (3081374 bytes/sec)
  - (dd if=/dev/da0 skip=1000000 count=1000000 bs=512 | gzip ...)
  - 1000000+0 records in
  - 1000000+0 records out
  - 512000000 bytes transferred in 77.709048 secs (6588679 bytes/sec)
  - (restore from image)
  - (gunzip ... dd of=/dev/da1 seek=17000000 count=1000000 bs=512 ...)
  - 921836+0 records in
  - 921835+0 records out
  - 471979520 bytes transferred in 68.117466 secs (6928906 bytes/sec ...)
  - (gunzip ... dd of=/dev/da1 seek=18000000 count=1000000 bs=512 ...)
  - 0+0 records in
  - 0+0 records out
  - 0 bytes transferred in 0.000025 secs (0 bytes/sec ...)

**Finish at Mon Oct 28 15:48:04 EST 2002**

--- Error messages ---

**dd:** /dev/dal: end of device

**Sectors Compared:** 17921835

**Sectors Differ:** 0

**Diffs range:**

Source (17938985) has 17150 more sectors than destination (17921835)
Expected Results: Source disk is unchanged
src compares qualified equal to dst, src is truncated on dst truncation is logged

Actual Results: No anomalies

Analysis: Expected results achieved

---

Case DI(Linux)-38 for FreeBSD 4.4 dd

Case Summary: Create an image from a LINUX SCSI source disk to a LINUX SCSI destination disk and the source contains a NTFS partition where the source disk is smaller than the destination

Tester Name: JRL
Test Date: Sat Nov 09 14:59:17 2002

PC: Cadfael

Disks:
Source: DOS Drive 80 Physical Label 31
Destination: DOS Drive 81 Physical Label 34
Image media: DOS Drive 80 Physical Label 7A
31 is a FUJITSU MAG3091L SUN9.0G with 17689266 sectors
34 is a FUJITSU MAG3091L SUN9.0G with 17689266 sectors
7A is a MAXTOR 6L040J2 with 78177792 sectors

Source disk setup:
NTFS only
Disk: 31
Host: Cadfael
Operator: JRL
OS: NT_No_os
Options: none
Date: Thu Nov 07 12:05:40 2002
cmd: Z:\ss\DISKWIPE.EXE 31 Cadfael 80 31 /src /new_log
X:\pm\pqmagic /cmd=X:\pm\nt-src.txt
No OS loaded, NTFS partition only
cmd: Z:\ss\DISKHASH.EXE 31 Cadfael 80 /before /new_log
Disk hash = 595739865F30C86E3CE5BA03BF1895E008721BD

Destination setup:
Z:\ss\DISKWIPE.EXE 38 Cadfael 81 34 /noask /dst /new_log /comment JRL

Execute:
Boot to DOS
Z:\ss\DISKWIPE.EXE 38 Cadfael 81 34 /noask /dst /new_log /comment JRL
A:\SECHASH.EXE 38 Cadfael 81 /first 1237005 /last 1333394 /log prehash.txt
Boot to FreeBSD
dd_image da0s1 dals1 38
(backup to image)
(dd if=/dev/da0s1 skip=0 count=1000000 bs=512 | gzip ...)
(dd if=/dev/da0s1 skip=1000000 count=1000000 bs=512 | gzip ...)
(dd if=/dev/da0s1 skip=2000000 count=1000000 bs=512 | gzip ...)
...
(restore from image)
...
(gunzip ... dd of=/dev/dals1 seek=0 count=1000000 bs=512 ...)
(gunzip ... dd of=/dev/dals1 seek=1000000 count=1000000 bs=512 ...)
(gunzip ... dd of=/dev/dals1 seek=2000000 count=1000000 bs=512 ...)
A:\SECHASH.EXE 38 Cadfael 81 /first 1237005 /last 1333394 /log posthash.txt
Shutdown FreeBSD, Boot to DOS
Z:\ss\PARTCMP.EXE 38 Cadfael 80 31 81 34 /new_log /comment JRL /select 1 1
Z:\ss\DISKHASH.EXE 38 Cadfael 80 /comment 31(JRL) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4/38

Log File
Source disk Drive 0x80, BIOS: Extensions Present
Interrupt 13 bios 1022/254/63 (max cyl/hd values)
Interrupt 13 ext 01023/255/63 (number of cyl/hd)
17689267 total number of sectors reported via interrupt 13 from the BIOS
N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 0000000063 001236942 0000/001/01 0076/254/63 07 NTFS
2 P 0000000000 0000000000 0000/000/00 0000/000/00 00 empty entry
3 P 0000000000 0000000000 0000/000/00 0000/000/00 00 empty entry
4 P 0000000000 0000000000 0000/000/00 0000/000/00 00 empty entry

48 of 57
Destination disk Drive 0x81, BIOS: Extensions Present
Interrupt 13 bios 1022/254/63 (max cyl/hd values)
Interrupt 13 ext 01023/255/63 (number of cyl/hd)
17689267 total number of sectors reported via interrupt 13 from the BIOS

N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 000000063 001333332 000/001/01 0082/254/63 07 NTFS
2 P 000000000 000000000 000/000/00 0000/000/00 00 empty entry
3 P 000000000 000000000 000/000/00 0000/000/00 00 empty entry
4 P 000000000 000000000 000/000/00 0000/000/00 00 empty entry
dd_image da0s1 da1s1 38

(backup to image)
dk-backup /dev/da0s1 38
Sat Nov 9 16:01:02 EST 2002
(dd if=/dev/da0s1 skip=0 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 72.971234 secs (7016464 bytes/sec)
(dd if=/dev/da0s1 skip=1000000 count=1000000 bs=512 | gzip ...)
236942+0 records in
236942+0 records out
121314304 bytes transferred in 17.381283 secs (6979594 bytes/sec)
...(restore from image)
...
512000000 bytes transferred in 6262.947796 secs (81751 bytes/sec ...)
(gunzip ... dd of=/dev/da1s1 seek=1000000 count=1000000 bs=512 ...)
236942+0 records in
236942+0 records out
121314304 bytes transferred in 1421.955202 secs (85315 bytes/sec ...)
(gunzip ... dd of=/dev/da1s1 seek=2000000 count=1000000 bs=512 ...)
0+0 records in
0+0 records out
0 bytes transferred in 0.000019 secs (0 bytes/sec ...)
Finish at Sat Nov 9 18:10:37 EST 2002
--- Error messages ---
no message

Sectors Compared 1236942
Sectors Differ 0
Diffs range:
Source (1236942) has 96390 fewer sectors than destination (1333332)
Zero fill: 0
Src Byte fill (31): 0
Dst Byte fill (34): 96389
Other fill: 0
Other no fill: 1
Excess Sectors Hashes:
Before dd 31C2BD77EE38AC8395F8CC11FB0D337B4A213B04
After dd 31C2BD77EE38AC8395F8CC11FB0D337B4A213B04
Hash after test: 595739865F30C86E3CE5BA03BF1895E008721B8D

Expected Results:
Source disk is unchanged
src compares qualified equal to dst

Actual Results:
No anomalies
Analysis: Expected results achieved

Case DI/Linux)-42 for FreeBSD 4.4 dd

Case Summary: Create an image from a LINUX SCSI source disk
to a LINUX SCSI destination disk
and the source contains a LINUX partition
where the source disk is the same size as the destination

Tester Name: JRL
Test Date: Sat Nov 09 10:11:07 2002
PC: HecRamsey

Disks:
Source: DOS Drive 80 Physical Label E3
Destination: DOS Drive 81 Physical Label E2
Image media: DOS Drive 80 Physical Label 71
E3 is a QUANTUM ATLAS10K2-TYO92J with 17938985 sectors
E2 is a QUANTUM ATLAS10K2-TYO92J with 17938985 sectors
17 is a IC35L040AVER07-0 with 80418240 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0
### Source disk setup:

- **Dual boot Linux/Windows Me with EXT2 & Fat16**
- **Disk:** E3
- **Host:** Cadfael
- **Operator:** JRL
- **OS:** Linux Red Hat 7.1/Windows Me
- **Date:** Sat Jul 21 16:17:29 2001

**DISKWIPE.EXE** E3_SRC Rumpole 80 E3 /src /new_log

X:\pm\pqmagic /cmd=X:\pm\fat-src.txt

Load Operating System to Source disk

**DISKHASH.EXE** E3_SRC Rumpole 80 /before

**Disk hash = 0F9DACDA6C63D197C048782003D324108CEC7AB0**

### Destination setup:

- **Z:\\ss\DISKWIPE.EXE** 42 HecRamsey 81 E2 /noask /dst /new_log /comment JRL

**Execute:**

- Boot to DOS
  - Z:\\ss\DISKWIPE.EXE 42 HecRamsey 81 E2 /noask /dst /new_log /comment JRL
  - Boot to FreeBSD
    - dd_image da0s3 da1s2 42
      - (backup to image)
        - (dd if=/dev/da0s3 skip=0 count=1000000 bs=512 | gzip ...)
        - (dd if=/dev/da0s3 skip=1000000 count=1000000 bs=512 | gzip ...)

- (restore from image)

- (gunzip ... dd of=/dev/da1s2 seek=5000000 count=1000000 bs=512 ...)
- (gunzip ... dd of=/dev/da1s2 seek=6000000 count=1000000 bs=512 ...)
- (gunzip ... dd of=/dev/da1s2 seek=7000000 count=1000000 bs=512 ...)

- Shutdown FreeBSD, Boot to DOS
  - Z:\\ss\PARTCMP.EXE 42 Wimsey 80 E3 81 E2 /new_log /comment JRL /select 9
  - Z:\\ss\DISKHASH.EXE 42 Wimsey 80 /comment E3(JRL) /new_log /after

**Log files loc: Test-archive/dd/freebsd-4.4/42**

### Log File

**Highlights:**

- **Source disk Drive 0x80, BIOS: Extentions Present**
- **Interrupt 13 bios 1022/255/63 (max cly/hd values)**
- **Interrupt 13 ext 01023/255/63 (number of cly/hd)**

**17938985 total number of sectors reported via interrupt 13 from the BIOS**

<table>
<thead>
<tr>
<th>N</th>
<th>Start</th>
<th>LBA</th>
<th>Length</th>
<th>Start C/H/S</th>
<th>End C/H/S</th>
<th>boot</th>
<th>Partition type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P</td>
<td>000000063</td>
<td>001236942</td>
<td>0000/001/01</td>
<td>0076/254/63</td>
<td>06 Fat16</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>00002249100</td>
<td>007181055</td>
<td>0140/000/01</td>
<td>0058/254/63</td>
<td>05 extended</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>000000063</td>
<td>0000208782</td>
<td>0140/001/01</td>
<td>0152/254/63</td>
<td>83 Linux</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>0000208845</td>
<td>000144585</td>
<td>0153/000/01</td>
<td>0161/254/63</td>
<td>05 extended</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>S</td>
<td>000000063</td>
<td>000144522</td>
<td>0153/001/01</td>
<td>0161/254/63</td>
<td>06 Fat16</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td>004450005</td>
<td>00192780</td>
<td>0417/000/01</td>
<td>00428/254/63</td>
<td>05 extended</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>S</td>
<td>000000063</td>
<td>00192717</td>
<td>0417/001/01</td>
<td>0248/254/63</td>
<td>16 other</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>S</td>
<td>000000000</td>
<td>00000000</td>
<td>0000/000/00</td>
<td>0000/000/00</td>
<td>00 empty entry</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>P</td>
<td>009430155</td>
<td>006152895</td>
<td>0587/000/01</td>
<td>0969/254/63</td>
<td>83 Linux</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>P</td>
<td>017510850</td>
<td>000417690</td>
<td>1023/000/01</td>
<td>1023/254/63</td>
<td>82 Linux swap</td>
<td></td>
</tr>
</tbody>
</table>

**Destination disk Drive 0x81, BIOS: Extensions Present**

**Interrupt 13 bios 1022/254/63 (max cly/hd values)**

**17938985 total number of sectors reported via interrupt 13 from the BIOS**

<table>
<thead>
<tr>
<th>N</th>
<th>Start</th>
<th>LBA</th>
<th>Length</th>
<th>Start C/H/S</th>
<th>End C/H/S</th>
<th>boot</th>
<th>Partition type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P</td>
<td>000000063</td>
<td>001236942</td>
<td>0000/001/01</td>
<td>0076/254/63</td>
<td>06 Fat16</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>P</td>
<td>001237005</td>
<td>006152895</td>
<td>0077/000/01</td>
<td>0459/254/63</td>
<td>83 Linux</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>P</td>
<td>000000000</td>
<td>00000000</td>
<td>0000/000/00</td>
<td>0000/000/00</td>
<td>00 empty entry</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>P</td>
<td>000000000</td>
<td>00000000</td>
<td>0000/000/00</td>
<td>0000/000/00</td>
<td>00 empty entry</td>
<td></td>
</tr>
</tbody>
</table>

**dd_image da0s3 da1s2 42**

(backup to image)

**dk-backup /dev/da0s3 42**

Sat Nov 9 10:35:14 EST 2002

(dd if=/dev/da0s3 skip=0 count=1000000 bs=512 | gzip ...)

1000000+0 records in
1000000+0 records out
51200000 bytes transferred in 102.951913 secs (4973196 bytes/sec)

(dd if=/dev/da0s3 skip=1000000 count=1000000 bs=512 | gzip ...)

1000000+0 records in
1000000+0 records out
51200000 bytes transferred in 94.126571 secs (5439484 bytes/sec)

(restore from image)
512000000 bytes transferred in 235.610245 secs (2173080 bytes/sec ...) 
(gunzip ... dd of=/dev/dalsa2 seek=6000000 count=1000000 bs=512 ...) 
152895+0 records in 
152895+0 records out 
78282240 bytes transferred in 36.035787 secs (2172347 bytes/sec ...) 
(gunzip ... dd of=/dev/dalsa2 seek=7000000 count=1000000 bs=512 ...) 
0+0 records in 
0+0 records out 
0 bytes transferred in 0.018088 secs (0 bytes/sec ...) 
Finish at Sat Nov 9 15:37:01 EST 2002 

--- Error messages --- 
no message 
- - - Measurement Logs - - - 
Sectors Compared 6152895 
Sectors Differ 0 
Diffs range: 
Hash after test: 0F9DACDA6C63D197C048782003D324108CEC7AB0 

**Expected Results:** 
Source disk is unchanged 
src compares equal to dst 

**Actual Results:** 
No anomalies 

**Analysis:** Expected results achieved 

### Case DI(Linux)-45 for FreeBSD 4.4 dd 

**Case Summary:** Create an image from a LINUX SCSI source disk to a LINUX SCSI destination disk and the source contains a FAT16 partition where the source disk is larger than the destination 

**Tester Name:** JRL 

**Test Date:** Tue Oct 22 07:03:39 2002 

**PC:** Rumpole 

**Disks:** 
Source: DOS Drive 80 Physical Label E3 
Destination: DOS Drive 81 Physical Label EB 
Image media: DOS Drive 80 Physical Label 71 
E3 is a QUANTUM ATLAS10K2-TY092J with 17938985 sectors 
EB is a SEAGATE ST39204LC with 17921835 sectors 
71 is a IC35L040AVER07-0 with 80418240 sectors 

**Source disk setup:** 
Dual boot Linux/Windows Me with EXT2 & Fat16 

**Disk:** E3 

Host: Cadfael 
Operator: JRL 
OS: Linux Red Hat 7.1/Windows Me 
Date: Sat Jul 21 16:17:29 2001 

`DISKWIPE.EXE E3_SRC Rumpole 80 E3 /src /new_log` 
X:\pm\pqmagic /cmd=X:\pm\fat-src.txt 
Load Operating System to Source disk 
`DISKHASH.EXE E3_SRC Rumpole 80 /before` 

Disk hash = 0F9DACDA6C63D197C048782003D324108CEC7AB0 

**Destination Setup:** 
Z:\ss\DISKWIPE.EXE 45 Rumpole 81 EB /noask /dst /new_log /comment JRL 

**Execute:** 
Boot to DOS 
Z:\ss\DISKWIPE.EXE 45 Rumpole 81 EB /noask /dst /new_log /comment JRL 
Boot to FreeBSD 
dd_image da0s1 dals1 45 
(dd if=/dev/da0s1 skip=0 count=1000000 bs=512 | gzip ...) 
(dd if=/dev/da0s1 skip=1000000 count=1000000 bs=512 | gzip ...) 
(dd if=/dev/da0s1 skip=2000000 count=1000000 bs=512 | gzip ...) 
... 
(restore from image) 
... 
(gunzip ... dd of=/dev/dalsa2 seek=0 count=1000000 bs=512 ...) 
(gunzip ... dd of=/dev/dalsa2 seek=1000000 count=1000000 bs=512 ...) 
(gunzip ... dd of=/dev/dalsa2 seek=2000000 count=1000000 bs=512 ...) 
Shutdown FreeBSD, Boot to DOS 
Z:\ss\PARTCMP.EXE 45 Rumpole 80 E3 81 EB /new_log /comment JRL /select 1 
Z:\ss\DISKHASH.EXE 45 Rumpole 80 /comment E3(JRL) /new_log /after
Log files loc: test-archive/dd/freebsd-4.4/45

Log File Highlights:
Source disk Drive 0x80, BIOS: Extensions Present
Interrupt 13 bios 1022/254/63 (max cyl/hd values)
Interrupt 13 ext 01023/255/63 (number of cyl/hd)
17938985 total number of sectors reported via interrupt 13 from the BIOS
N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 000000063 001236942 0000/001/01 0076/254/63 Boot 06 Fat16
2 X 002249100 007181055 0140/000/01 0586/254/63 05 extended
3 S 000000063 000208782 0140/001/01 0152/254/63 83 Linux
4 X 000208845 000144585 0153/000/01 0161/254/63 05 extended
5 S 000000063 000144522 0153/001/01 0161/254/63 06 Fat16
6 X 004450005 000192780 0417/000/01 0428/254/63 05 extended
7 S 000000063 000192717 0417/001/01 0428/254/63 16 other
8 S 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
9 P 004930155 006152895 0587/000/01 0969/254/63 83 Linux
10 P 017510850 00417690 1023/000/01 1023/254/63 82 Linux swap
Destination disk Drive 0x81, BIOS: Extensions Present
Interrupt 13 bios 1022/254/63 (max cyl/hd values)
Interrupt 13 ext 01023/255/63 (number of cyl/hd)
17921835 total number of sectors reported via interrupt 13 from the BIOS
N Start LBA Length Start C/H/S End C/H/S boot Partition type
1 P 000000063 001236942 0000/001/01 0076/254/63 Boot 06 Fat16
2 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
3 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
4 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
5 S 000000063 001140552 0000/001/01 0070/254/63 06 Fat16
6 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
7 P 000000000 000000000 0000/000/00 0000/000/00 00 empty entry
8 S 000000063 000208845 0000/001/01 001236942 05 extended
9 P 004930155 006152895 0587/000/01 0969/254/63 83 Linux
10 P 017510850 00417690 1023/000/01 1023/254/63 82 Linux swap

dd_image da0s1 da1s1 45
(backup to image)
dk-backup /dev/da0s1 45
Tue Oct 22 07:34:14 EDT 2002
(dd if=/dev/da0s1 skip=0 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 154.814580 secs (3307182 bytes/sec)
(dd if=/dev/da0s1 skip=1000000 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 154.814580 secs (3307182 bytes/sec)
(... restore from image)
... (gunzip ... dd of=/dev/da1s1 seek=1000000 count=1000000 bs=512 ...)
dd: /dev/da1s1: end of device
140553+0 records in
140552+0 records out
71962624 bytes transferred in 9.727593 secs (7397783 bytes/sec)
(gunzip ... dd of=/dev/da1s1 seek=2000000 count=1000000 bs=512 ...)
0+0 records in
0+0 records out
0 bytes transferred in 0.000018 secs (0 bytes/sec ...)
Finish at Tue Oct 22 07:38:34 EDT 2002
--- Error messages ---
dd: /dev/da1s1: end of device
- - - Measurement Logs - - -
Sectors Compared 1140552
Sectors Differ 0
Diffs range:
Source (1236942) has 96390 more sectors than destination (1140552)
Hash after test: 0F9DACDA6C63D197C048782003D324108CEC7AB0

Expected Results:
Source disk is unchanged
src compares qualified equal to dst, src is truncated on dst
truncation is logged

Actual Results:
No anomalies

Analysis: Expected results achieved

Case DI(Linux)-48 for FreeBSD 4.4 dd
Case Summary: Create an image from a LINUX IDE source disk
to a LINUX SCSI destination disk
where the source disk is smaller than the destination
Tester Name: SN
Test Date: Fri Oct 25 10:17:34 2002
PC: HecRamsey

Disks:
Source: DOS Drive 80 Physical Label F6
Destination: DOS Drive 81 Physical Label CC
Image media: DOS Drive 80 Physical Label 7A
F6 is an IBM-DTLA-307020 with 40188960 sectors
CC is a SEAGATE ST336705LC with 71687370 sectors
7A is a MAXTOR 6L040J2 with 78177792 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup:
Windows 2000 with NTFS & Fat32
Disk: F6
Host: Wimsey
Operator: JRL
OS: Windows 2000
Date: Sat Jul 21 15:53:12 2001
DISKWIPE.EXE F6_SRC Wimsey 80 F6 /src /new_log /noask /comment Windows 2000/NT source
X:\pm\pqmagic /cmd=X:\pm\nt-src.txt
Load Operating System to Source disk
DISKHASH.EXE LX-27 Morse 80 /before
Disk hash = 8034683D5D55BA51409AC7B5CB0845CA2CF6B235

Destination Setup:
Z:\ss\DISKWIPE.EXE 48 HecRamsey 81 CC /noask /dst /new_log /comment SN
Execute:
Boot to DOS
Z:\ss\DISKWIPE.EXE 48 HecRamsey 81 CC /noask /dst /new_log /comment SN
Boot to FreeBSD
dd_image ad1 da0 48
(backup to image)
(dd if=/dev/ad1 skip=0 count=1000000 bs=512 | gzip ...)
(dd if=/dev/ad1 skip=1000000 count=1000000 bs=512 | gzip ...)
(dd if=/dev/ad1 skip=2000000 count=1000000 bs=512 | gzip ...)
... (restore from image) ...
(gunzip ... dd of=/dev/da0 seek=39000000 count=1000000 bs=512 ...)
(gunzip ... dd of=/dev/da0 seek=40000000 count=1000000 bs=512 ...)
(gunzip ... dd of=/dev/da0 seek=41000000 count=1000000 bs=512 ...)
Shutdown FreeBSD, Boot to DOS
Z:\ss\DISKCOMP.EXE 48 HecRamsey 80 F6 81 CC /new_log /comment SN
Z:\ss\DISKHASH.EXE 48 HecRamsey 80 /comment F6(SN) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4/48

Log File
Highlights:
dd_image ad1 da0 48
(backup to image)
dk-backup /dev/ad1 48
Fri Oct 25 11:03:41 EDT 2002
(dd if=/dev/ad1 skip=0 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 129.503648 secs (3953557 bytes/sec)
(dd if=/dev/ad1 skip=1000000 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 129.986947 secs (3938857 bytes/sec)
... (restore from image) ...
512000000 bytes transferred in 64.819951 secs (7898803 bytes/sec ...)
(gunzip ... dd of=/dev/da0 seek=39000000 count=1000000 bs=512 ...)
188960+0 records in
188960+0 records out
96747520 bytes transferred in 12.257774 secs (7892748 bytes/sec ...)
(gunzip ... dd of=/dev/da0 seek=40000000 count=1000000 bs=512 ...)
0+0 records in
0+0 records out
0 bytes transferred in 0.000016 secs (0 bytes/sec ...)
Finish at Fri Oct 25 13:06:43 EDT 2002
=== Error messages ===
no message
- - - = Measurement Logs - - -
Sectors Compared 40188960
Sectors Differ 0
Diffs range
Source (40188960) has 31498410 fewer sectors than destination (71687370)
Zero fill: 0
Src Byte fill (F6): 0
Dst Byte fill (CC): 31498410
Other fill: 0
Other no fill: 0
Hash after test: 8034683D5D55BA51409AC7B5C80845CA2CF6B235

Expected Results:
Source disk is unchanged
dst compares qualified equal to dst

Actual Results:
No anomalies

Analysis:
Expected results achieved

---

Case DI(Linux)-49 for FreeBSD 4.4 dd

Case Summary:
Create an image from a LINUX IDE source disk to a LINUX SCSI destination disk where the source disk is larger than the destination

Tester Name: SN
Test Date: Tue Oct 29 17:26:41 2002
PC: Wimsey

Disks:
Source: DOS Drive 80 Physical Label F6
Destination: DOS Drive 81 Physical Label E2
Image media: DOS Drive 80 Physical Label 71
F6 is an IBM-DTLA-307020 with 40188960 sectors
E2 is a QUANTUM ATLAS10K2-TYO92J with 17938985 sectors
71 is a IC35L040AVER07-0 with 80418240 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup:
Windows 2000 with NTFS & Fat32
Disk: F6
Host: Wimsey
Operator: JRL
OS: Windows 2000
Date: Sat Jul 21 15:53:12 2001
DISKWIPE.EXE F6_SRC Wimsey 80 F6 /src /new_log /noask /comment Windows 2000/NT source
X:\pm\pqmagic /cmd=X:\pm\nt-src.txt
Load Operating System to Source disk
DISKHASH.EXE LX-27 Morse 80 /before
Disk hash = 8034683D5D55BA51409AC7B5C80845CA2CF6B235

Destination Setup:
Z:\ss\DISKWIPE.EXE 49 Wimsey 81 E2 /noask /dst /new_log /comment SN

Execute:
Boot to DOS
Z:\ss\DISKWIPE.EXE.49 Wimsey 81 E2 /noask /dst /new_log /comment SN
Boot to FreeBSD
dd_image ad1 da0 49
(backup to image)
(dd if=/dev/ad1 skip=0 count=1000000 bs=512 | gzip ...)
(dd if=/dev/ad1 skip=1000000 count=1000000 bs=512 | gzip ...)
(dd if=/dev/ad1 skip=2000000 count=1000000 bs=512 | gzip ...)
...(restore from image)
...(gunzip ... dd of=/dev/da0 seek=39000000 count=100000 bs=512 ...)
...(gunzip ... dd of=/dev/da0 seek=40000000 count=1000000 bs=512 ...)
...(gunzip ... dd of=/dev/da0 seek=41000000 count=1000000 bs=512 ...)
Shutdown FreeBSD, Boot to DOS
Z:\ss\DISKCMP.EXE.49 Wimsey 80 F6 81 E2 /new_log /comment SN
Z:\ss\DISKHASH.EXE.49 Wimsey 80 /comment F6(SN) /new_log /after

Log files loc: test-archive/dd/freebsd-4.4/49

Log File
Highlights:
/dd_image ad1 da0 49
(backup to image)
dk-backup /dev/ad1 49
Tue Oct 29 17:41:19 EST 2002
(dd if=/dev/ad1 skip=0 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 148.369448 secs (3450845 bytes/sec)
(dd if=/dev/ad1 skip=1000000 count=1000000 bs=512 | gzip ...)
1000000+0 records in
Case DI(Linux)-51 for FreeBSD 4.4 dd

Case Summary: Create an image from a LINUX SCSI source disk to a LINUX IDE destination disk where the source disk is smaller than the destination.

Tester Name: JRL

Test Date: Thu Oct 24 09:21:15 2002

PC: AndWife

Disks:
- Source: DOS Drive 80 Physical Label E4
- Destination: DOS Drive 81 Physical Label A7
- Image media: DOS Drive 80 Physical Label 93
- E4 is a QUANTUM ATLAS10K2-TY092J with 17938985 sectors
- A7 is a WDC WD200BB-00AUA1 with 39102336 sectors
- 93 is a WDC WD300BB-00CAAO with 58633344 sectors
- Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
- CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup:
- Windows 2000 with NTFS & Fat32
- Disk: E4
- Host: JudgeDee
- Operator: JRL
- OS: Windows 2000/NT
- Date: Sat Jul 21 16:58:28 2001
- DISKWIPE.EXE E4_src JudgeDee 80 E4 /src /noask /comment Windows 2000 source disk
- X:\pm\pqmagic /cmd=X:\pm\nt-src.txt
- Load Operating System to Source disk
- cmd: X:\ss\DISKHASH.EXE Hash Wimsey 80 /comment E4 /new_log /before
- Disk hash = 25BF8AF6B3D3E0BD1909C96E368DB270SF1C49CBF

Destination Setup:
- Z:\ss\DISKWIPE.EXE 51 AndWife 81 A7 /noask /dst /new_log /comment JRL

Execute:
- Boot to DOS
- Z:\ss\DISKWIPE.EXE 51 AndWife 81 A7 /noask /dst /new_log /comment JRL
- Boot to FreeBSD
dd_image da0 ad1 51 (backup to image)
(dd if=/dev/da0 skip=0 count=1000000 bs=512 | gzip ...)
(dd if=/dev/da0 skip=1000000 count=1000000 bs=512 | gzip ...)
(dd if=/dev/da0 skip=2000000 count=1000000 bs=512 | gzip ...)
...
(restored from image)
...
(gunzip ... dd of=/dev/ad1 seek=16000000 count=1000000 bs=512 ...)
Log files loc: test-archive/dd/freebsd-4.4/51

Log File
Highlights:

dk-backup /dev/da0 51
Thu Oct 24 10:04:28 EDT 2002
(dd if=/dev/da0 skip=0 count=1000000 bs=512 | gzip ...)
1000000+0 records in
1000000+0 records out
512000000 bytes transferred in 122.032941 secs (4195588 bytes/sec)

(gunzip ... dd of=/dev/ad1 seek=17000000 count=1000000 bs=512 ...)
938985+0 records in
938985+0 records out
480760320 bytes transferred in 86.063116 secs (5586137 bytes/sec)

Finish at Thu Oct 24 10:58:31 EDT 2002

Expected Results:
Source disk is unchanged
src compares qualified equal to dst

Actual Results:
No anomalies

Analysis:
Expected results achieved

---
Case DI(Linux)-52 for FreeBSD 4.4 dd

Case Summary: Create an image from a LINUX SCSI source disk
to a LINUX IDE destination disk
where the source disk is larger than the destination

Tester Name: JRL
Test Date: Fri Nov 01 12:34:12 2002
PC: Cadfael
Disks:
Source: DOS Drive 80 Physical Label E4
Destination: DOS Drive 81 Physical Label 65
Image media: DOS Drive 80 Physical Label 7A
E4 is a QUANTUM ATLAS10K2-TY092J with 17938985 sectors
65 is a WD20074AZAA with 12594960 sectors
7A is a MAXTOR 6L040J2 with 78177792 sectors
Windows 98 [Version 4.10.2222] DOS boot floppy with run scripts
CD-ROM with PartitionMagic Pro 6.0 and FS-TST Release 1.0

Source disk setup:
Windows 2000 with NTFS & Fat32
Disk: E4
Host: JudgeDee
Operator: JRL
OS: Windows 2000/NT
Date: Sat Jul 21 16:58:28 2001
| DISKWIPE.EXE E4_SRC JudgeDee 80 E4 /src /noask /comment Windows 2000 source disk |
| X:\pm\pqmagic /cmd=X:\pm\nt-src.txt |
| Load Operating System to Source disk |
| cmd: X:\ss\DISKHASH.EXE Hash Wimsey 80 /comment E4 /new_log /before |
| Disk hash = 25BF8AF6B2D3E0BD1909C96E368DB27F51C49CBF |

### Destination Setup:

| Z:\ss\DISKWIPE.EXE 52 Cadfael 81 65 /noask /dst /new_log /comment JRL |

### Execute:

**Boot to DOS**

Z:\ss\DISKWIPE.EXE 52 Cadfael 81 65 /noask /dst /new_log /comment JRL

Boot to FreeBSD

dd_image da0 ad1 52

(backup to image)

(dd if=/dev/da0 skip=0 count=1000000 bs=512 | gzip ...)

(dd if=/dev/da0 skip=1000000 count=1000000 bs=512 | gzip ...)

(dd if=/dev/da0 skip=2000000 count=1000000 bs=512 | gzip ...)

...(restore from image)

...(restore from image)

(gunzip ... dd of=/dev/ad1 seek=16000000 count=1000000 bs=512 ...)

(gunzip ... dd of=/dev/ad1 seek=17000000 count=1000000 bs=512 ...)

(gunzip ... dd of=/dev/ad1 seek=18000000 count=1000000 bs=512 ...)

Shutdown FreeBSD, Boot to DOS

Z:\ss\DISKCMP.EXE 52 Cadfael 81 E4 80 65 /new_log /comment JRL

Z:\ss\DISKHASH.EXE 52 Cadfael 80 /comment E4(JRL) /new_log /after

### Log files loci:

Test archive/dd/freebsd-4.4/52

### Log File

dd_image da0 ad1 52

(backup to image)

dk-backup /dev/da0 52

Fri Nov 1 13:43:56 EST 2002
(dd if=/dev/da0 skip=0 count=1000000 bs=512 | gzip ...)

1000000+0 records in

1000000+0 records out

512000000 bytes transferred in 116.740583 secs (4385793 bytes/sec)

(dd if=/dev/da0 skip=1000000 count=1000000 bs=512 | gzip ...)

1000000+0 records in

1000000+0 records out

512000000 bytes transferred in 108.969500 secs (4698562 bytes/sec)

...(restore from image)

...(restore from image)

(gunzip ... dd of=/dev/ad1 seek=17000000 count=1000000 bs=512 ...)

dd: /dev/ad1: Invalid argument

1+0 records in

0+0 records out

0 bytes transferred in 0.000748 secs (0 bytes/sec ...)

(gunzip ... dd of=/dev/ad1 seek=18000000 count=1000000 bs=512 ...)

0+0 records in

0+0 records out

0 bytes transferred in 0.000210 secs (0 bytes/sec ...)

Finish at Fri Nov 1 20:34:40 EST 2002

--- Error messages ---

dd: /dev/ad1: end of device

- - - - Measurement Logs - - - -

Sectors Compared 12594960

Sectors Differ 0

Sects range

Source (17938985) has 5344025 more sectors than destination (12594960)

Hash after test: 25BF8AF6B2D3E0BD1909C96E368DB27F51C49CBF

### Expected Results:

Source disk is unchanged

src compares qualified equal to dst, src is truncated on dst truncation is logged

### Actual Results:

No anomalies

### Analysis:

Expected results achieved
About the National Institute of Justice

NIJ is the research, development, and evaluation agency of the U.S. Department of Justice. The Institute provides objective, independent, evidence-based knowledge and tools to enhance the administration of justice and public safety. NIJ's principal authorities are derived from the Omnibus Crime Control and Safe Streets Act of 1968, as amended (see 42 U.S.C. §§ 3721–3723).

The NIJ Director is appointed by the President and confirmed by the Senate. The Director establishes the Institute's objectives, guided by the priorities of the Office of Justice Programs, the U.S. Department of Justice, and the needs of the field. The Institute actively solicits the views of criminal justice and other professionals and researchers to inform its search for the knowledge and tools to guide policy and practice.

Strategic Goals

NIJ has seven strategic goals grouped into three categories:

Creating relevant knowledge and tools
1. Partner with State and local practitioners and policymakers to identify social science research and technology needs.
2. Create scientific, relevant, and reliable knowledge—with a particular emphasis on terrorism, violent crime, drugs and crime, cost-effectiveness, and community-based efforts—to enhance the administration of justice and public safety.
3. Develop affordable and effective tools and technologies to enhance the administration of justice and public safety.

Dissemination
4. Disseminate relevant knowledge and information to practitioners and policymakers in an understandable, timely, and concise manner.
5. Act as an honest broker to identify the information, tools, and technologies that respond to the needs of stakeholders.

Agency management
6. Practice fairness and openness in the research and development process.
7. Ensure professionalism, excellence, accountability, cost-effectiveness, and integrity in the management and conduct of NIJ activities and programs.

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In addressing these strategic challenges, the Institute is involved in the following program areas: crime control and prevention, including policing; drugs and crime; justice systems and offender behavior, including corrections; violence and victimization; communications and information technologies; critical incident response; investigative and forensic sciences, including DNA; less-than-lethal technologies; officer protection; education and training technologies; testing and standards; technology assistance to law enforcement and corrections agencies; field testing of promising programs; and international crime control.

In addition to sponsoring research and development and technology assistance, NIJ evaluates programs, policies, and technologies. NIJ communicates its research and evaluation findings through conferences and print and electronic media.