Product Bulletin 76

Product	StorNext® versions 4.1.1, 4.1.2, 4.1.3, and 4.2.0
Summary	StorNext customers using the Data Movement Integrity Check Option can receive false checksum errors for correctly recoverable files.
Date	October 2011

Overview

In StorNext 4.1.1, the implementation of the checksum used by Storage Manager was modified to obtain a performance gain in calculation time. These changes were not intended to affect checksum values. However, a software defect has been found which causes StorNext to compute a non-MD5-compliant checksum in certain cases.

Note: The user data is not manipulated or modified in any circumstances. It is solely the MD5 checksum calculation which is incorrect. StorNext users do not lose data.

Access to the file may be affected when their sizes fall within specific ranges around multiples of approximately 512 MBytes which depend on the blocking factor used when writing the media:

```
For a given blocking factor (BF), affected file sizes are:
 ((536870912 * N) – (65536 * BF)) through
       ((536870912 * N) – 1)
For all N >= 1.


Example calculations using a blocking factor of 8:

    536,346,624 through   536,870,911 inclusive
  1,073,217,536 through 1,073,741,823 inclusive
  1,610,088,448 through 1,610,612,735 inclusive
  2,146,959,360 through 2,147,483,647 inclusive
  2,683,830,272 through 2,684,354,559 inclusive
  (etc.)
```

Only about 0.1% of all possible file sizes are affected for the default blocking factor of 8. Continuing the example, for that same blocking factor of 8, any file smaller than 536,346,624 bytes is not affected. The number of files sizes affected does change with the blocking factor.

The following figure visually represents the range of file sizes affected by the issue.

Note: The figure is not to scale. The widths of the blue bands are much smaller.
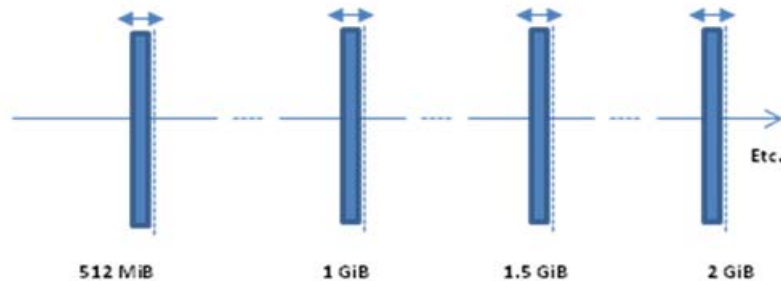
For more information, contact the Quantum Technical Assistance Center and reference CR 35637.

Symptoms

This problem is seen only by customers licensed for Advanced Integrity Check and using checksum validation.

The symptom of the problem is checksum validation failure upon file retrieve for the specific and limited file sizes covered in the description above. Note that when retrieving multiple files via fsretrieve, some of the files may fail when they are grouped with an affected file.

The fsretrieve command could break the list of files into groups. If any file in the group is one of the affected files, all files that follow it on that specific media will fail to be retrieved.

The level of risk and impact could vary greatly from site to site.

Following are some items which could raise the risk:

1 Using file sizes larger than the approximate 512 MByte size.

2 Workflows which size or segment files near the specified ½ GByte intervals.

Following are some items which could raise the impact:

1 Retrieving multiple files via `fsretrieve`, particularly in conjunction with raised risk items.

2 Multiple file retrieves in a workflow that retrieves many files from the same media in one request.

Solution

This issue will be addressed in future StorNext releases. For more information, please contact the Quantum Technical Assistance Center and reference CR 35637.

Workaround

The recommended workaround is to disable checksum validation (but not generation) until a StorNext release containing the fix is available.

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Contacting Quantum

More information about StorNext is available on the Quantum Service and Support website at www.quantum.com/ServiceandSupport. The Quantum Service and Support website contains a collection of information, including answers to frequently asked questions (FAQs). You can also access software, firmware, and drivers through this site.

For further assistance, contact the Quantum Technical Assistance Center:

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