SQL Server: Advanced Corruption Recovery Techniques

Module 3: Useful Undocumented DBCC Commands

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Introduction

- **As well as the documented DBCC commands, there are many undocumented DBCC commands**
- **While most of these are only useful for the Microsoft test teams, some are invaluable for investigating database structures and dealing with database corruption**

- **In this module we'll cover:**
  - DBCC IND
  - DBCC PAGE
  - DBCC DBINFO
  - DBCC DBTABLE
  - DBCC WRITEPAGE

DBCC IND

- **DBCC IND dumps a tabular list of allocated pages**
  - dbcc ind ({ 'dbname' | dbid }, { 'objname' | objid }, { nonclustered indid | 1 | 0 | -1 | -2 } [, partition_number])
- **Third parameter options:**
  - Nonclustered index ID – just that nonclustered index
  - 0 – just the heap or clustered index
  - 1 – just the clustered index
  - -1 – the heap or clustered index and all nonclustered indexes
  - -2 – IAM pages from the heap or clustered index and all nonclustered indexes
- **Works in all versions of SQL Server**
- **There is a new DMV in SQL Server 2012**
  - sys.dm_db_database_page_allocations, which gives slightly different output

DBCC PAGE

- **DBCC PAGE dumps an individual page**
  - dbcc page ({'dbname' | dbid}, filenum, pagenum [, printopt={0|1|2|3}])
  - Use WITH TABLERESULTS to get tabular output
- **Requires trace flag 3604 to be enabled to get results**
- **Four parts to the output:**
  - The BUF structure from the buffer pool
  - The page header
  - The allocation status of the page and the extent it is part of
  - Dump of the page contents
- **Printopt options:**
  - 0 – everything except the page contents
  - 1 – hex dump of records on the page
  - 2 – hex dump of the whole page
  - 3 – hex dump and interpretation of records on the page

DBCC DBINFO

- **DBCC DBINFO dumps the boot page information for a database**
  - dbcc dbinfo [('dbname')]
  - Use WITH TABLERESULTS to get tabular output
- **Requires trace flag 3604 to be enabled to get results**
- **Fields of interest:**
  - dbi_RebuildLogs
  - dbi_dbccFlags
  - dbi_updSysCatalog
  - dbi_dbccLastKnownGood

DBCC DBTABLE

- **DBCC DBTABLE dumps internal information about the database**
  - dbcc dbtable [({'dbname' | dbid})]
  - Use WITH TABLERESULTS to get tabular output
- **Requires trace flag 3604 to be enabled to get results**
- **Sections of output:**
  - Database metadata
  - File control blocks for each file
  - Transaction log metadata
    - Log manager information
    - Log cache entries
    - VLF control block
    - Log truncation manager information
  - Database startup timing information

DBCC WRITEPAGE

- **DBCC WRITEPAGE is used to directly update a page**
  - dbcc writepage ({'dbname' | dbid}, fileid, pageid, offset, length, data [, directORbufferpool])
- **USE THIS COMMAND ENTIRELY AT YOUR OWN RISK!**
- **Extremely useful for creating corrupt databases to test with**
- **I added the directORbufferpool option in SQL Server 2005 to allow page checksum failures to be simulated**
  - The buffer pool is flushed for the database
  - The file's real FCB is unhooked and a new one created
  - The page is read directly into memory and updated
  - The page is written directly back to disk, bypassing the buffer pool
  - The file's real FCB is put back
- **Also useful for manually attempting to fix database corruption**
- **See my blog post at http://bit.ly/XfMkOv**

Summary

- **There are several undocumented DBCC commands that are useful when investigating and dealing with database corruption**
  - Especially DBCC PAGE for examining page contents
- **DBCC WRITEPAGE is one of the most useful and dangerous commands**
  - Use this command with care, and entirely at your own risk

- **In the next module, we'll discuss:**
  - Damaged or missing transaction log
  - EMERGENCY mode
  - EMERGENCY-mode repair
  - Reattaching a detached SUSPECT database