

Clean-Dirty Pages

Thursday, May 25, 2017 1:54 PM

Object Explorer

AlterBufferPool.sql...ter (LABS\delip (53))* CleanDirtyPageCoun... (LABS\delip (56))*

--A clean page is one that has not been changed since it was last read from or written to disk.
--A dirty page has been changed and copy on disk and in memory is different.
--Another way to get details about buffer pool is to use performance counters (Perfmon).
--There is an object called "Buffer Manager."

--How do dirty pages get flushed to disk? Well, that's the job of checkpoint,
-- which is a background process

```
SELECT (CASE
    WHEN ( [database_id] = 32767 ) THEN 'Resource Database'
    ELSE Db_name (database_id)
    END ) AS 'Database Name',
    Sum(CASE
        WHEN ( [is_modified] = 1 ) THEN 0
        ELSE 1
    END) AS 'Clean Page Count',
    Sum(CASE
        WHEN ( [is_modified] = 1 ) THEN 1
        ELSE 0
    END) AS 'Dirty Page Count'
FROM sys.dm_os_buffer_descriptors
GROUP BY database_id
ORDER BY DB_NAME(database_id);
```

127 %

Results Messages

	Database Name	Clean Page Count	Dirty Page Count
1	Resource Database	2293	0
2	LabData	5	1
3	master	166	18
4	model	4	0
5	msdb	9	0
6	NormalizedForms	132	0
7	Northwind	127	1
8	ReportServer	98	0
9	Schools	3	3
10	tempdb	44	30

Query executed successfully. | (local)\sqlexpress01 (13.0 ... | LABS\delip (56) | NormalizedForms | 00:00:00 | 10

Adding to Buffer Pool

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```
AlterBufferPool.sql...ter (LABS\delip (53))* X CleanDirtyPageCoun...(LABS\delip (56))*  
  
USE MASTER;  
GO  
  
-----  
--Add MORE room for Buffering to an SSC  
-----  
  
ALTER SERVER CONFIGURATION  
    SET BUFFER POOL EXTENSION ON  
    (FILENAME = 'E:\SSDCACHE\MYCACHE.BPE', SIZE = 50 GB);  
GO --.bpe (Buffer Pool Extension)  
  
-----  
--To reconfigure Turn off then ALTER again  
-----  
  
--ALTER SERVER CONFIGURATION  
--  SET BUFFER POOL EXTENSION OFF;  
--GO  
  
--ALTER SERVER CONFIGURATION  
--  SET BUFFER POOL EXTENSION ON  
--  (FILENAME = 'E:\SSDCACHE\MYCACHE.BPE', SIZE = 100 GB);  
--GO
```

What is Columnar

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Here is an example of a simple database table with 4 columns and 3 rows.

ID	Last	First	Bonus
1	Doe	John	8000
2	Smith	Jane	4000
3	Beck	Sam	1000

In a **row-oriented database** management system, the data would be stored like this:

1,Doe,John,8000;2,Smith,Jane,4000;3,Beck,Sam,1000;

In a **column-oriented database** management system, the data would be stored like this:

1,2,3;Doe,Smith,Beck;John,Jane,Sam;8000,4000,1000;

In a **row-based index**, the data in the Employee table is stored in one or more data pages, as shown in Figure 1.

Data Page			
FirstName	LastName	HireDate	Gender
Adam	Jorgensen	5/9/2008	Male
Sherri	McDonald	7/1/2009	Female
Brian	McDonald	9/15/2009	Male
...
Jose	Chinchilla	1/10/2010	Male
...
...
...
...

Gender
Male
Female
Male
Male

In a **column-based index**, the data in the Employee table is stored in separate pages for each of the columns, as shown in Figure 2.

Data Page
FirstName
Adam
Brian
Jose
Sherri
Tim
Tim

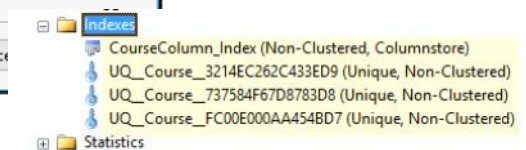
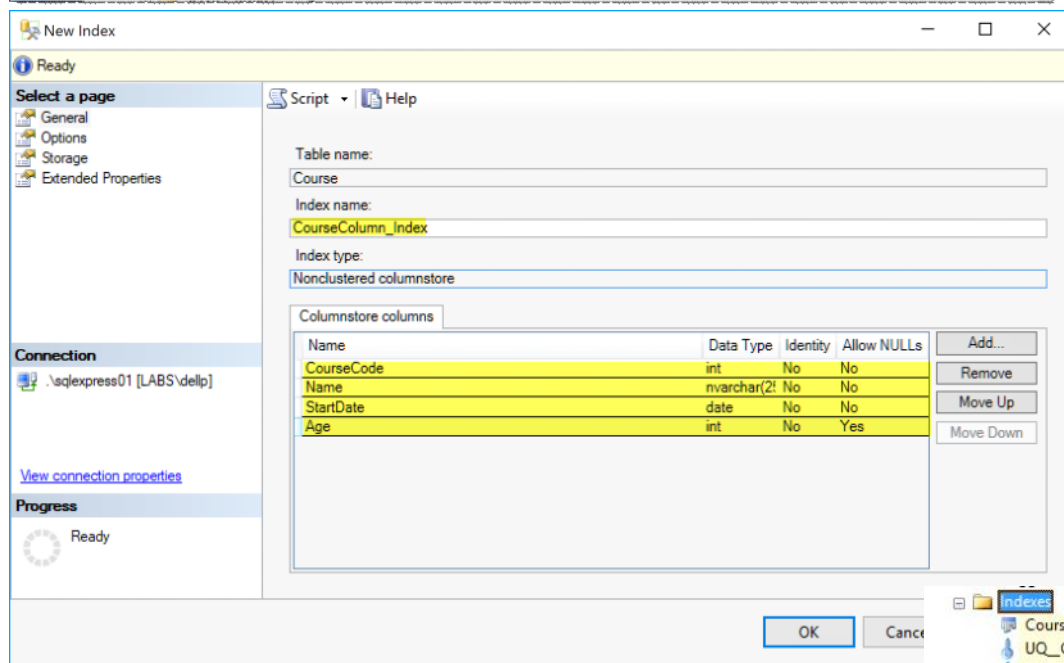
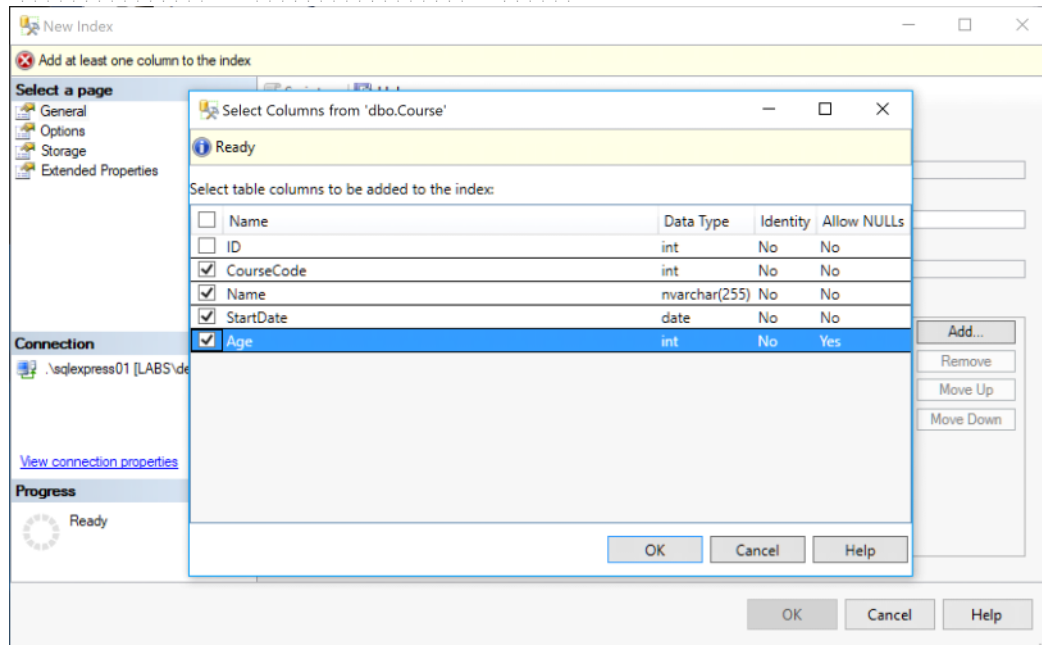
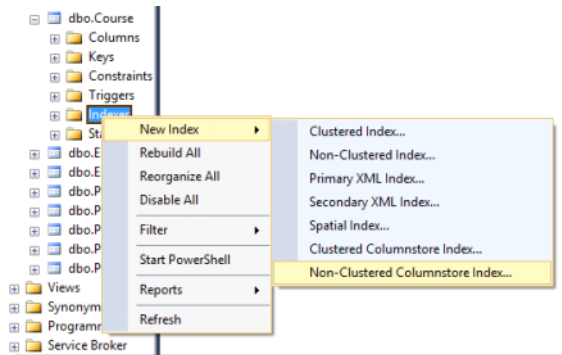
Data Page
LastName
Chinchilla
Jorgensen
McDonald
McDonald
Moolic
Murphy

Data Page
HireDate
5/9/2008
6/1/2008
7/1/2009
7/1/2009
9/15/2009
1/10/2010

Data Page
Gender
Female
Male
Male
Male
Male
Male

Column-Store (Click)

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Column-Store (Script)

Thursday, May 25, 2017 2:53 PM

```
ColumnsStore.sql -...ls (LABS\delip (64))*  AlterBufferPool.sql...ter (LABS\delip (53))*  CleanDirtyPageCoun...(LABS\delip (56))*  
  
USE Schools  
GO  
  
CREATE TABLE dbo . CourseColumnStore (  
    ID int NOT NULL,  
    CourseCode int NOT NULL,  
    Name nvarchar (255) NOT NULL,  
    Description nvarchar (max) NOT NULL,  
    StartDate date NOT NULL,  
    Age int NULL)  
GO  
  
CREATE NONCLUSTERED COLUMNSTORE INDEX CourseColumn_Index ON dbo . CourseColumnStore  
(  
    ID ,  
    CourseCode ,  
    Name ,  
    StartDate ,  
    Age  
)  
GO  
  
--DROP TABLE CourseColumnStore
```