

# How to rebuild and reorganize indexes

[Version 1.0]

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**QNE**  
**SOFTWARE**

**QNE TIPS**

Product : QNE Optimum


Version: 1.00

Doc No : 1

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REV. No	Nature of Change	Prepared By	Prepared Date	Reviewed & Approved by
1.0	Creation	Jason Lee	28/06/2021	

**Amendment Record**

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## SCENARIO

Searching and reading data is getting slower even after performed increased Disk Free Space and Disk Defragmentation but SSD is not an option then you can continue reading on how to detect database fragmentation and how to perform database defragmentation

Why need to perform rebuild and reorganize indexes?

>> To allow you to get the requested information quicker

When should perform rebuild and reorganize indexes?

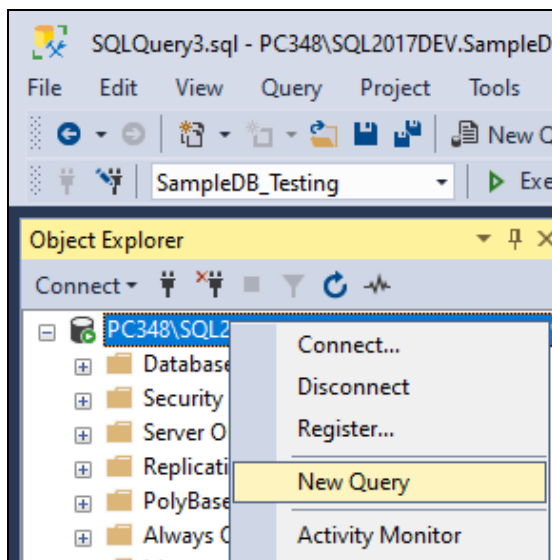
>> When fragmentation is 30% or higher


## SOLUTION

1. Connect your database with SSMS (SQL Server Management Studio)

<https://support.qne.com.my/a/solutions/articles/81000385373>

2. Right-click your server instance in Object Explorer, and then select New Query



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- To find out which are those indexes fragmentation percentage is 30% and higher

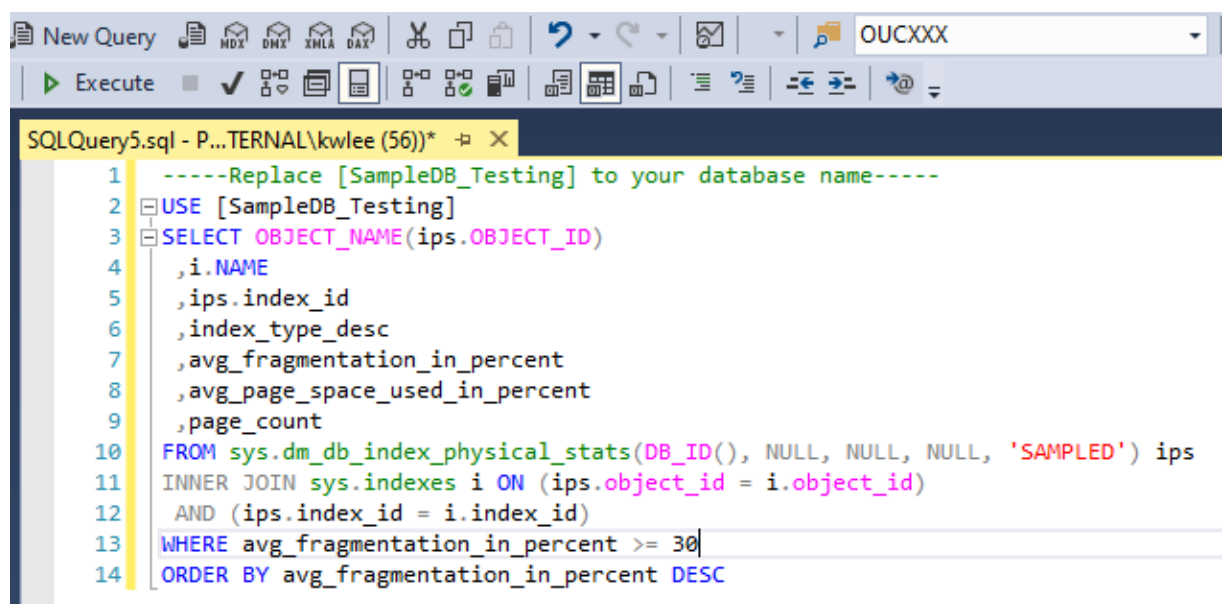
Paste the following T-SQL code snippet into the query window and *Replace [SampleDB\_Testing] to your database name*:

```

-----Replace [SampleDB_Testing] to your database name-----
USE [SampleDB_Testing]
SELECT OBJECT_NAME(ips.OBJECT_ID)
,i.NAME
,ips.index_id
,index_type_desc
,avg_fragmentation_in_percent
,avg_page_space_used_in_percent
,page_count
FROM sys.dm_db_index_physical_stats(DB_ID(), NULL, NULL, NULL, 'SAMPLED') ips
INNER JOIN sys.indexes i ON (ips.object_id = i.object_id)
AND (ips.index_id = i.index_id)
WHERE avg_fragmentation_in_percent >= 30
ORDER BY avg_fragmentation_in_percent DESC

```

- Execute the query by selecting Execute or selecting F5 on your keyboard

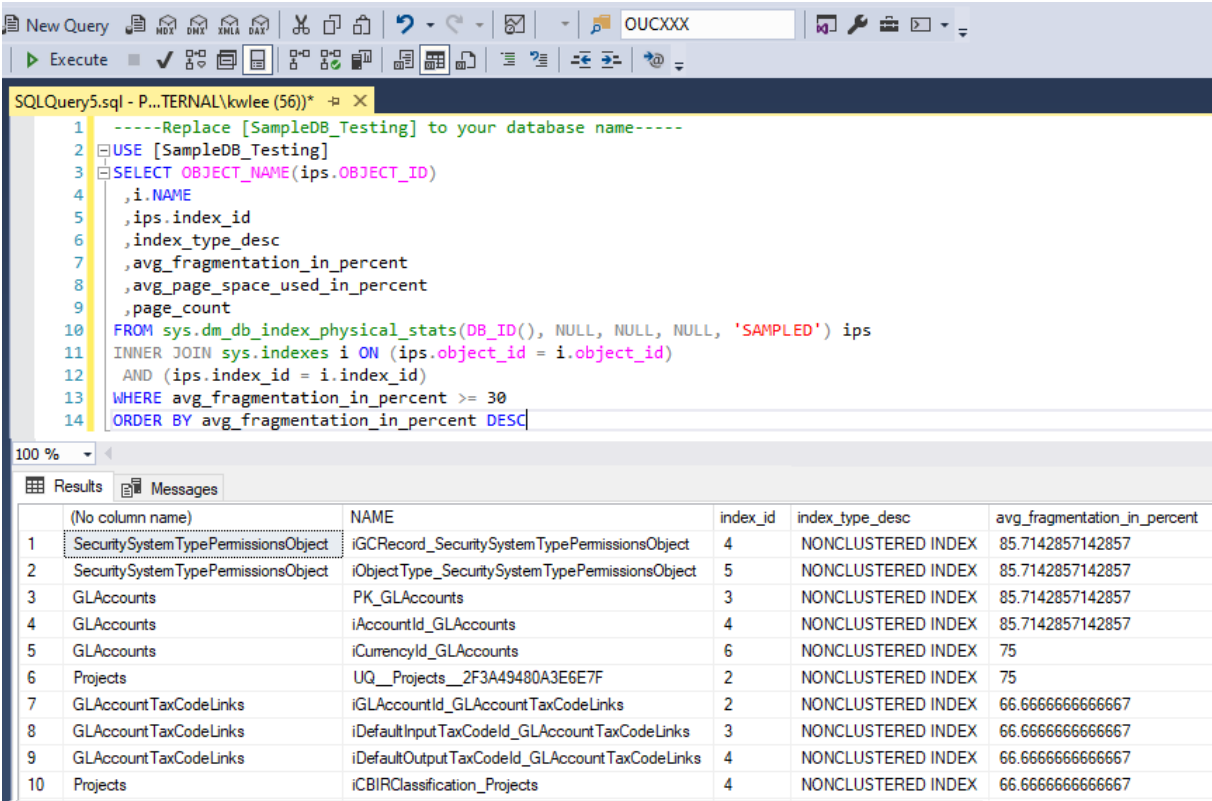


```

SQLQuery5.sql - P...TERNAL\kwlee (56)*
1  -----Replace [SampleDB_Testing] to your database name-----
2  USE [SampleDB_Testing]
3  SELECT OBJECT_NAME(ips.OBJECT_ID)
4  ,i.NAME
5  ,ips.index_id
6  ,index_type_desc
7  ,avg_fragmentation_in_percent
8  ,avg_page_space_used_in_percent
9  ,page_count
10 FROM sys.dm_db_index_physical_stats(DB_ID(), NULL, NULL, NULL, 'SAMPLED') ips
11 INNER JOIN sys.indexes i ON (ips.object_id = i.object_id)
12 AND (ips.index_id = i.index_id)
13 WHERE avg_fragmentation_in_percent >= 30
14 ORDER BY avg_fragmentation_in_percent DESC

```

5. The results of the indexes fragmentation is 30% and higher are displayed under the area where the text was entered.



```

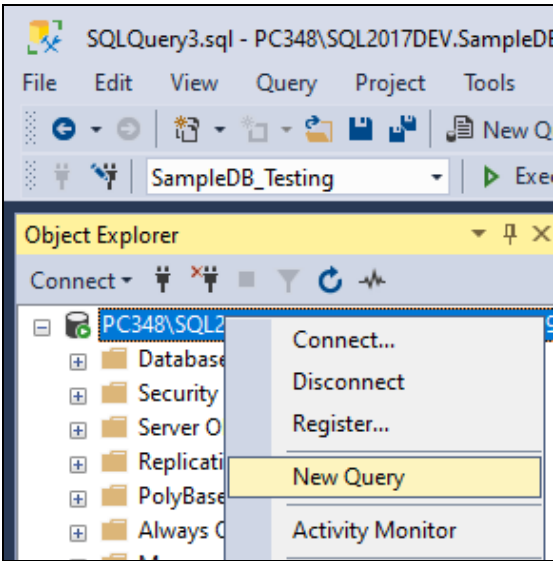
1  -----Replace [SampleDB_Testing] to your database name-----
2  USE [SampleDB_Testing]
3  SELECT OBJECT_NAME(ips.OBJECT_ID)
4  ,i.NAME
5  ,ips.index_id
6  ,index_type_desc
7  ,avg_fragmentation_in_percent
8  ,avg_page_space_used_in_percent
9  ,page_count
10 FROM sys.dm_db_index_physical_stats(DB_ID(), NULL, NULL, NULL, 'SAMPLED') ips
11 INNER JOIN sys.indexes i ON (ips.object_id = i.object_id)
12 AND (ips.index_id = i.index_id)
13 WHERE avg_fragmentation_in_percent >= 30
14 ORDER BY avg_fragmentation_in_percent DESC

```

	(No column name)	NAME	index_id	index_type_desc	avg_fragmentation_in_percent
1	SecuritySystemTypePermissionsObject	iGCRecord_SecuritySystemTypePermissionsObject	4	NONCLUSTERED INDEX	85.7142857142857
2	SecuritySystemTypePermissionsObject	iObjectType_SecuritySystemTypePermissionsObject	5	NONCLUSTERED INDEX	85.7142857142857
3	GLAccounts	PK_GLAccounts	3	NONCLUSTERED INDEX	85.7142857142857
4	GLAccounts	iAccountId_GLAccounts	4	NONCLUSTERED INDEX	85.7142857142857
5	GLAccounts	iCurrencyId_GLAccounts	6	NONCLUSTERED INDEX	75
6	Projects	UQ__Projects__2F3A49480A3E6E7F	2	NONCLUSTERED INDEX	75
7	GLAccountTaxCodeLinks	iGLAccountId_GLAccountTaxCodeLinks	2	NONCLUSTERED INDEX	66.6666666666667
8	GLAccountTaxCodeLinks	iDefaultInputTaxCodeId_GLAccountTaxCodeLinks	3	NONCLUSTERED INDEX	66.6666666666667
9	GLAccountTaxCodeLinks	iDefaultOutputTaxCodeId_GLAccountTaxCodeLinks	4	NONCLUSTERED INDEX	66.6666666666667
10	Projects	iCBIRClassification_Projects	4	NONCLUSTERED INDEX	66.6666666666667

6. To Rebuild and reorganize indexes fragmentation percentage is 30% and higher

Right-click your server instance in Object Explorer, and then select New Query





7. Paste the following T-SQL code snippet into the query window and *Replace [SampleDB\_Testing] to your database name:*


```
-----Replace [SampleDB_Testing] to your database name-----
USE [SampleDB_Testing]
declare @tableName nvarchar(500)
declare @indexName nvarchar(500)
declare @indexType nvarchar(55)
declare @percentFragment decimal(11,2)

declare FragmentedTableList cursor for
SELECT OBJECT_NAME(ind.OBJECT_ID) AS TableName,
       ind.name AS IndexName, indexstats.index_type_desc AS IndexType,
       indexstats.avg_fragmentation_in_percent
FROM sys.dm_db_index_physical_stats(DB_ID(), NULL, NULL, NULL, NULL) indexstats
INNER JOIN sys.indexes ind ON ind.object_id = indexstats.object_id
AND ind.index_id = indexstats.index_id
WHERE
-- indexstats.avg_fragmentation_in_percent , e.g. >30, you can specify any
number in percent
indexstats.avg_fragmentation_in_percent > 5
AND ind.Name is not null
ORDER BY indexstats.avg_fragmentation_in_percent DESC

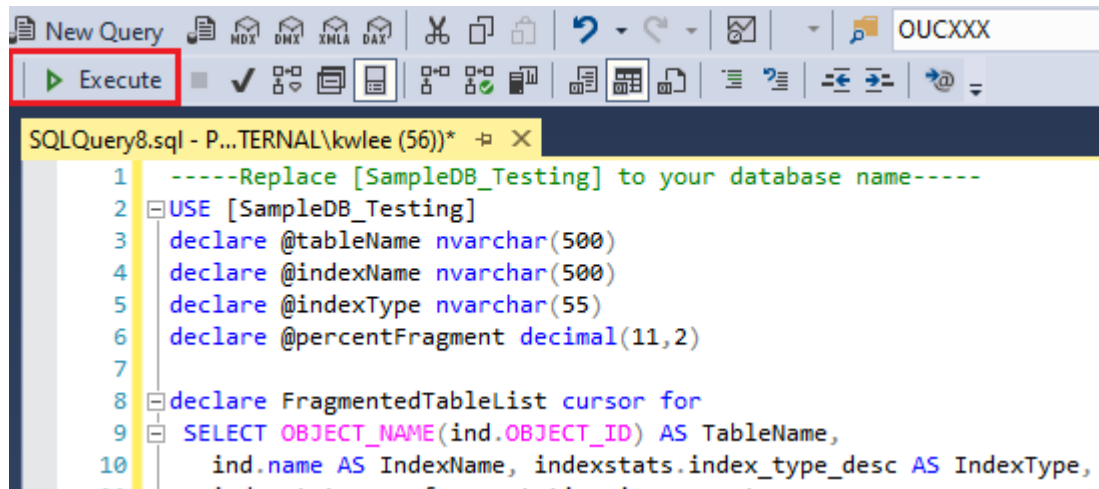
OPEN FragmentedTableList
FETCH NEXT FROM FragmentedTableList
INTO @tableName, @indexName, @indexType, @percentFragment

WHILE @@FETCH_STATUS = 0
BEGIN
    print 'Processing ' + @indexName + 'on table ' + @tableName + ' which is '
+ cast(@percentFragment as nvarchar(50)) + ' fragmented'

    if(@percentFragment<= 30)
    BEGIN
        EXEC( 'ALTER INDEX ' + @indexName + ' ON ' + @tableName + ' REBUILD;
')
        print 'Finished reorganizing ' + @indexName + 'on table ' + @tableName
    END
    ELSE
    BEGIN
        EXEC( 'ALTER INDEX ' + @indexName + ' ON ' + @tableName + '
REORGANIZE;')
        print 'Finished rebuilding ' + @indexName + 'on table ' + @tableName
    END
    FETCH NEXT FROM FragmentedTableList
    INTO @tableName, @indexName, @indexType, @percentFragment
END
CLOSE FragmentedTableList
DEALLOCATE FragmentedTableList
```

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8. Execute the query by selecting Execute or selecting F5 on your keyboard.



9. After the query is complete, all indexes with fragmentation more than 29.99% is defragmented

Know more about [Optimize index maintenance to improve query performance and reduce resource consumption](#)