

UNIVERSIDAD PRIVADA DE TACNA



FACULTAD DE INGENIERIA

Escuela Profesional de Ingeniería de Sistema

Informe de laboratorio 03

Curso: Base de datos II

DOCENTE: Ing. Patrick Cuadros Quiroga

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(2013046516)**

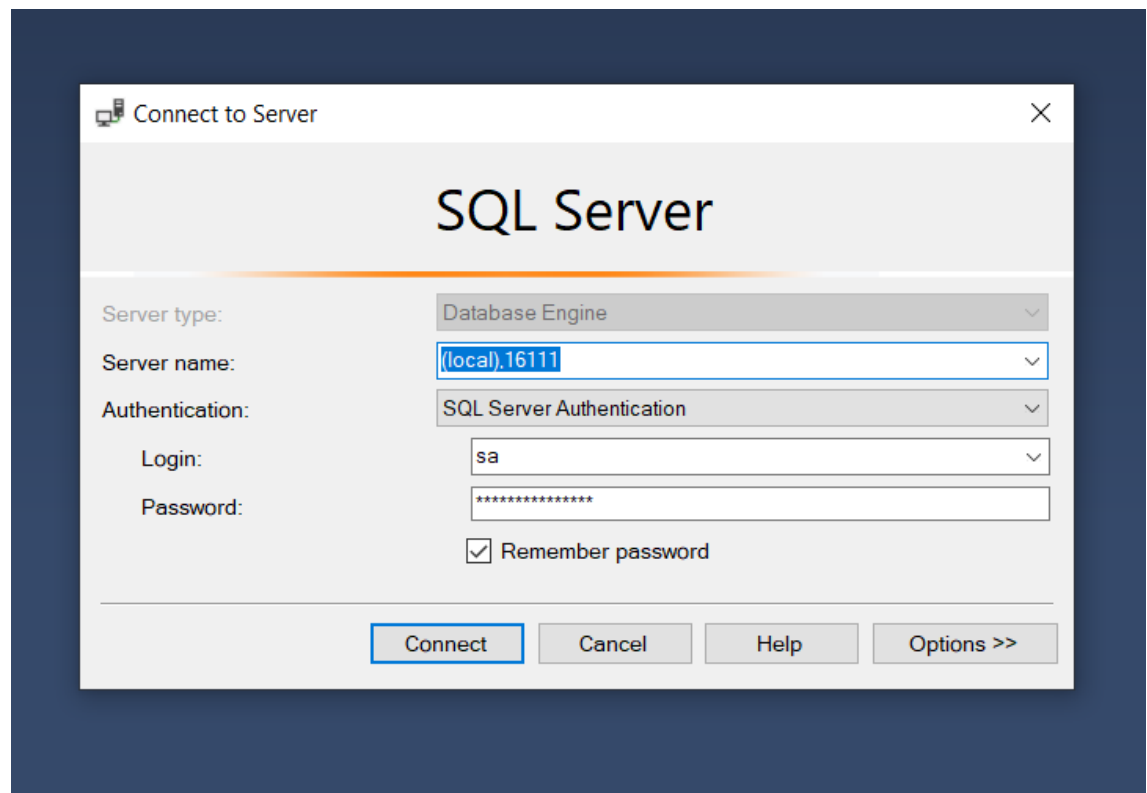
Tacna – Perú

2020

1. Crearemos un contenedor con el siguiente comando luego de tener la imagen del SQL server

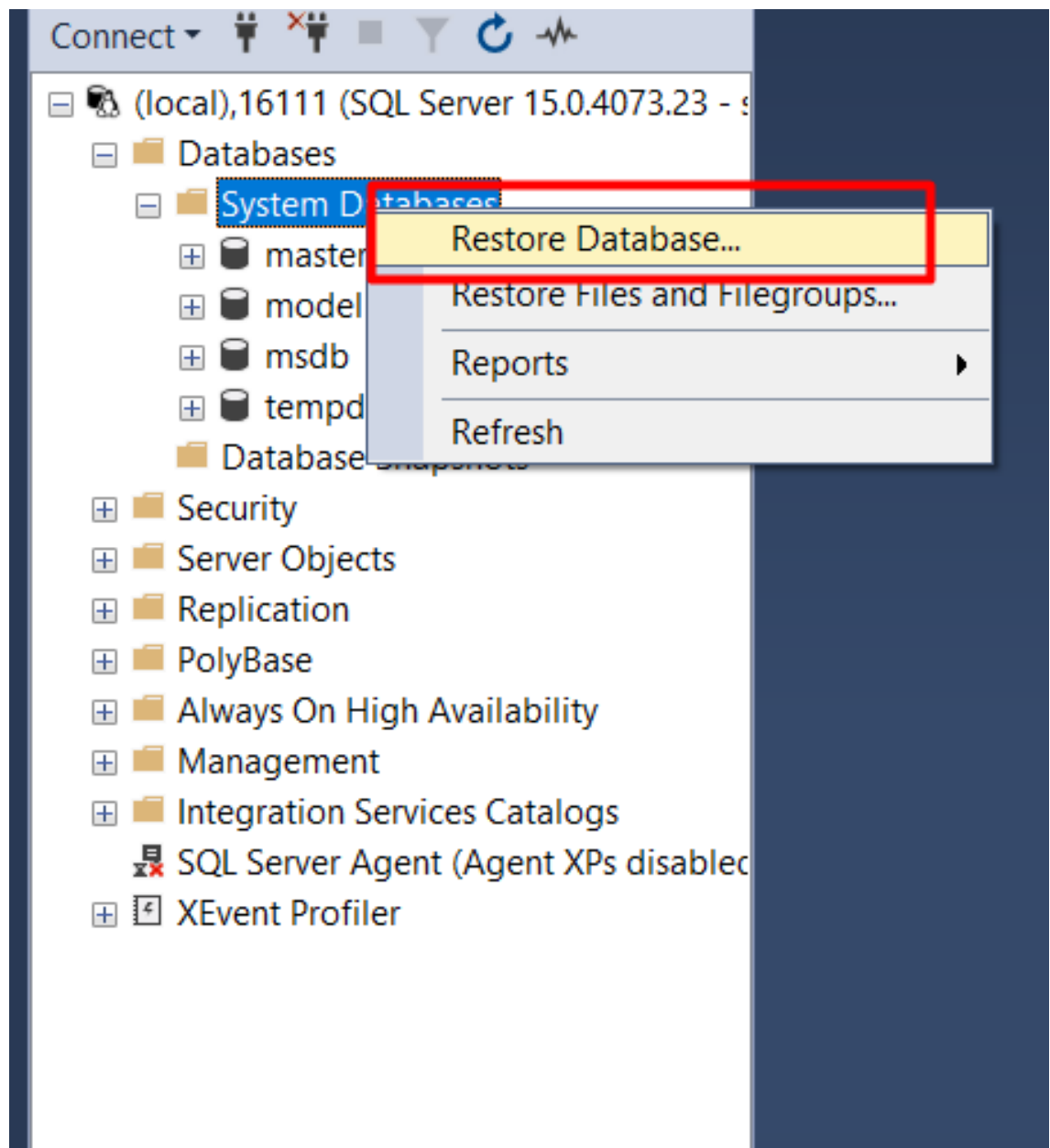
```
PS C:\Windows\system32> docker run -d -p 16111:1433 -e 'ACCEPT_EULA=Y' -e 'SA_PASSWORD=Tacna.2019' --name SQLNX01 mcr.microsoft.com/mssql/server
Unable to find image 'mcr.microsoft.com/mssql/server:latest' locally
latest: Pulling from mssql/server
171857c49d0f: Pull complete
8b5eb8c165f6: Pull complete
e7083eff87ee: Pull complete
61e52f862619: Pull complete
419640447d26: Pull complete
ec9a85cf10f9: Pull complete
Digest: sha256:bf3cc5fb2abfd327c6eeaf2a021869077298511eb6ded5fabd9a1e39ebff7c30
Status: Downloaded newer image for mcr.microsoft.com/mssql/server:latest
25a47c402179a54307ad49572228fa81a4d3f48d1b56ae055657b87a69e436a8
PS C:\Windows\system32>
```

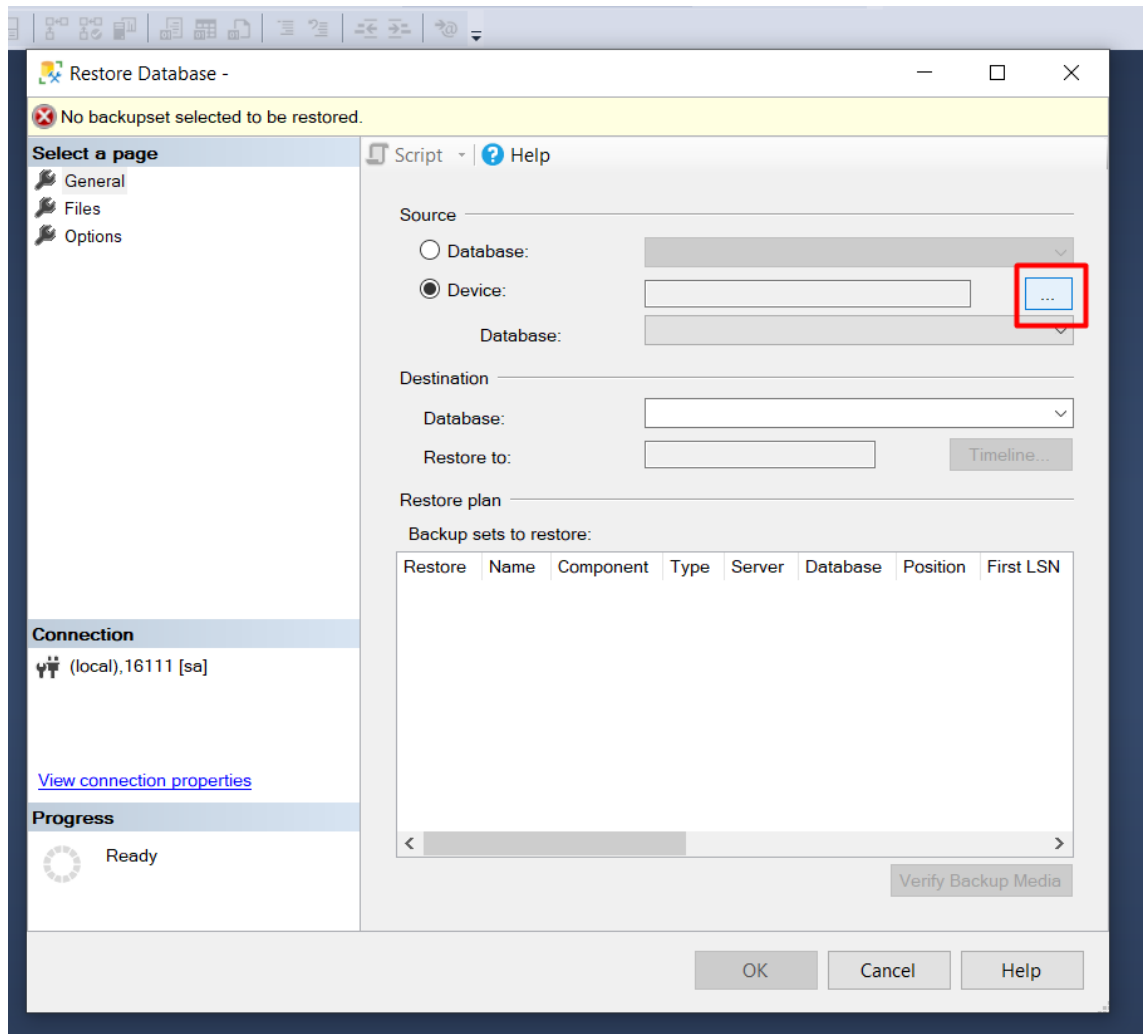
2. Nos conectamos con usuario: sa y clave: Tacna.2020

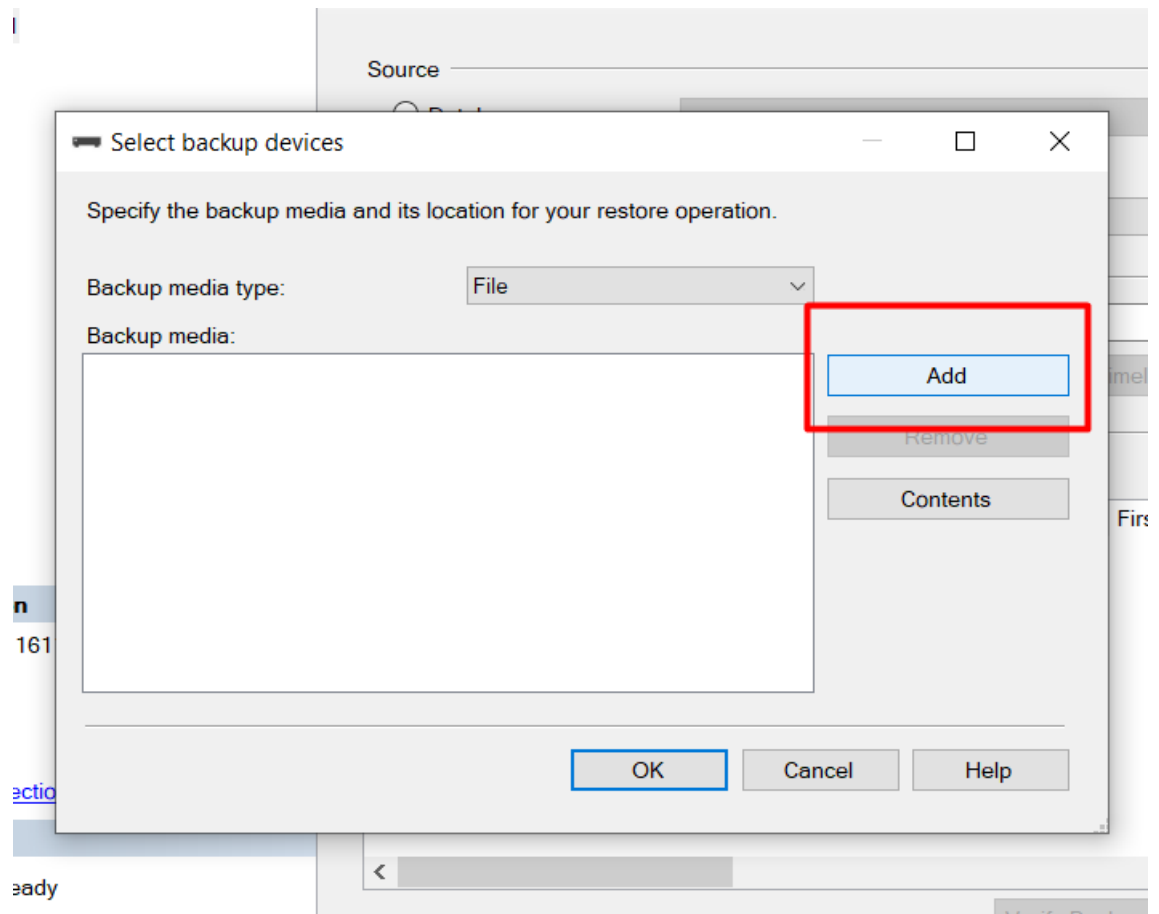


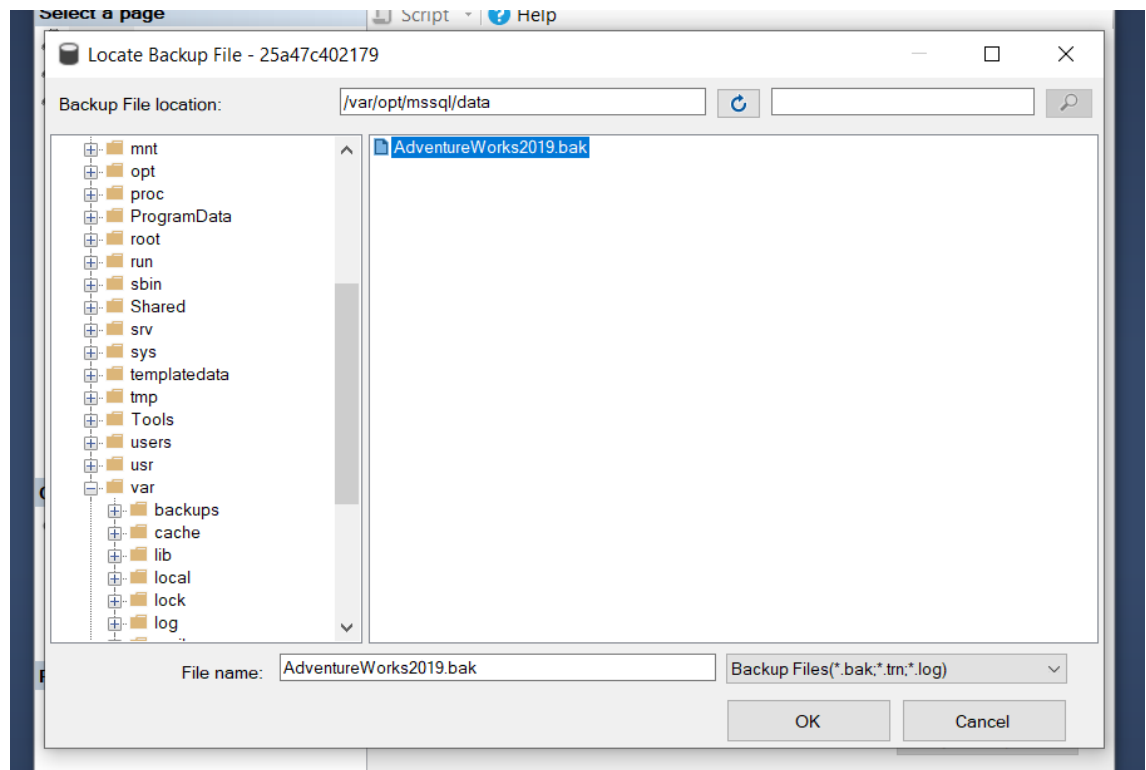
3. Restauramos la base de datos

```
Digest: sha256:bf3cc5fb2abfd327c6eeaf2a021869077298511e
Status: Downloaded newer image for mcr.microsoft.com/mssql/server:latest
25a47c402179a54307ad49572228+a81a4d3f48d1b56ae05565/b8/a69e436a8
PS C:\Windows\system32: docker cp D:\BaseDatosII\AdventureWorks2019.bak SQLLN01:/var/opt/mssql/data/
PS C:\Windows\system32:
```

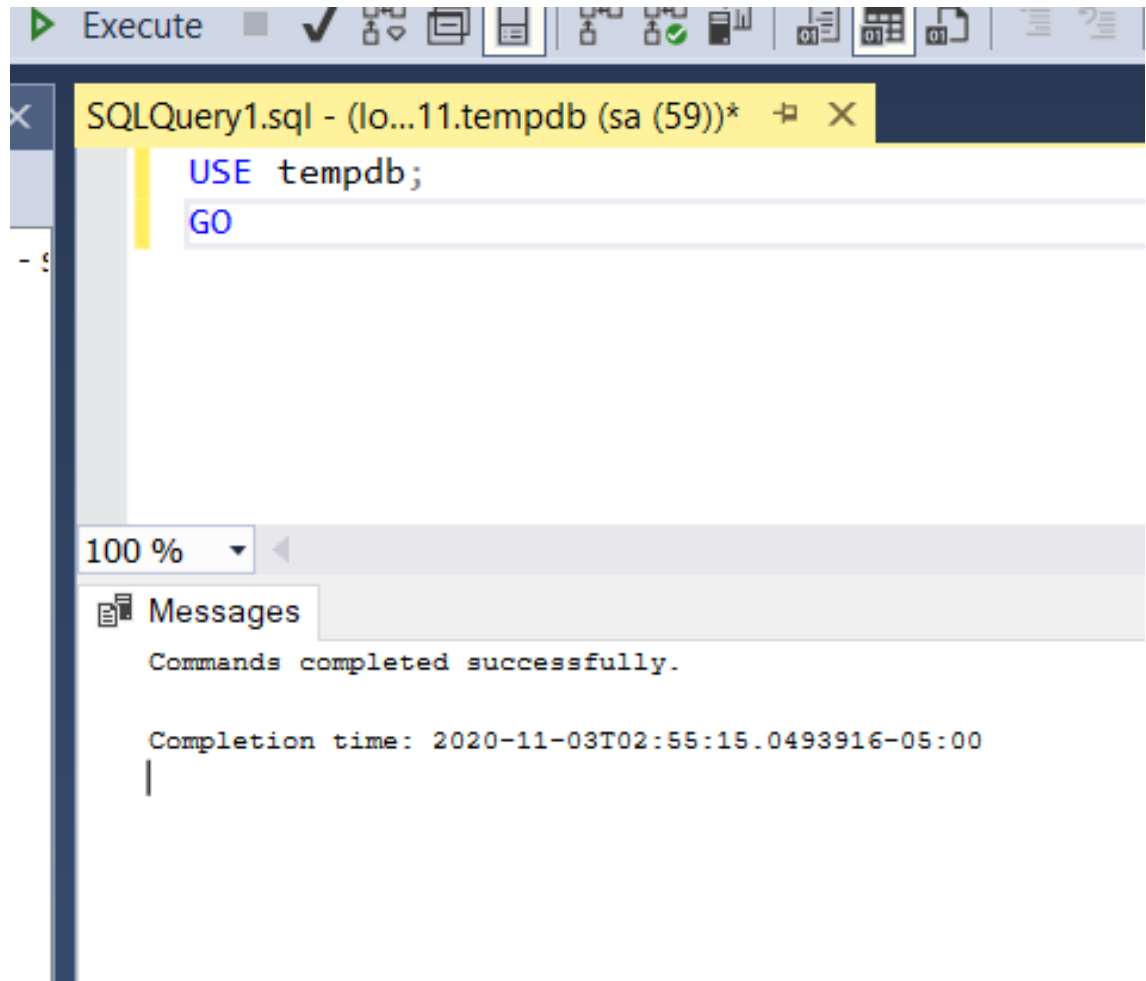








4. Abrir la base de datos AdventureWorks.



5. Consultar las estadísticas físicas de los índices. En la siguiente consulta los tres parámetros NULL, son el objeto, el índice y la partición. Por eso se muestran todos los índices.

SQLQuery1.sql - (lo...Works2019 (sa (59)))

```

SELECT obj.name, phys.* FROM sys.dm_db_index_physical_stats(DB_ID(), NULL, NULL, NULL, 'LIMITED') as phys
JOIN sys.objects as obj on obj.object_id = phys.object_id
ORDER BY avg_fragmentation_in_percent DESC;

```

	name	database_id	object_id	index_id	partition_number	index_type_desc	alloc_unit_type_desc	index_depth	index_level	avg_fragmentation_in_percent	fragment_count	avg_fragment_size_in_pages	page_count
1	EmployeePayHistory	5	2099048	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
2	SalesPersonQuotaHistory	5	254623950	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
3	Product	5	482100758	4	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
4	vStateProvinceCountryRegion	5	631673298	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
5	Product	5	482100758	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
6	SpecialOfferProduct	5	1070626857	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
7	StateProvince	5	1118627038	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
8	Store	5	1182627256	3	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
9	ProductProductPhoto	5	1218103380	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
10	ProductReview	5	1266103551	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
11	ProductVendor	5	1378103950	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
12	Vendor	5	1422628111	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
13	CountryRegion	5	1493580359	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
14	CountryRegion	5	1493580359	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
15	Employee	5	1893581784	5	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
16	EmployeeDepartmentHistory	5	2101582525	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2
17	DatabaseLog	5	901578250	0	1	HEAP	IN_ROW_DATA	1	0	44.8979591836735	45	173777777777778	782
18	SpecialOfferProduct	5	1070626857	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3
19	ProductReview	5	1266103551	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3
20	Store	5	1182627256	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3
21	BusinessEntityContact	5	1381579960	3	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3
22	BusinessEntityContact	5	1381579960	4	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3
23	ProductListPriceHistory	5	1010102639	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3
24	ProductCostHistory	5	770101784	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3
25	ProductDescription	5	834102012	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3
26	Employee	5	1893581784	4	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3
27	BusinessEntityContact	5	1381579960	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	25	2	2	4
28	Product	5	482100758	3	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	25	2	2	4

Query executed successfully. (local),16111 (15.0 RTM) sa (59) AdventureWorks2019 00:00:02 196 rows

Notas el porcentaje promedio de fragmentación $avg_fragmentation_in_percent$

6. Asimismo hay opciones en el nivel de detalle devuelto. la siguiente opción es SAMPLED.

SQLQuery1.sql - (AdventureWorks2019 (sa (59)))

```
SELECT * FROM sys.dm_db_index_physical_stats(DB_ID(),NULL,NULL,NULL,'SAMPLED')
ORDER BY avg_fragmentation_in_percent DESC;
```

100 %

Results Messages

	database_id	object_id	index_id	partition_number	index_type_desc	alloc_unit_type_desc	index_depth	index_level	avg_fragmentation_in_percent	fragment_count	avg_fragment_size_in_pages	page_count	avg_page_space_used_in_percent
1	5	2099048	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	74.1536940943909
2	5	254623950	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	53.3419817148505
3	5	482100758	4	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	80.9241413392637
4	5	631673298	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	30.3434642945392
5	5	482100758	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	94.600939671361
6	5	1070626557	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	99.6787744007907
7	5	1118627028	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	85.9154929577465
8	5	1182627256	3	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	60.6004447739066
9	5	1218103380	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	68.4704719545342
10	5	1266103551	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	63.466765053126
11	5	1378103950	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	56.8075117370892
12	5	1422628111	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	58.3271559179639
13	5	1493580359	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	69.2611811218186
14	5	1493580359	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	53.089706847047
15	5	1893581784	5	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	56.6963182004398
16	5	2101582525	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	54.8307388188782
17	5	1893581784	4	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3	70.1672102792192
18	5	1381579960	3	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3	67.3585371880405
19	5	1381579960	4	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3	67.3585371880405
20	5	1266103551	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3	41.0921670373116
21	5	1182627256	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3	75.0350135903138
22	5	1070626557	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3	90.8162466024216
23	5	1010102639	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3	73.1776624660242
24	5	770101784	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3	73.1776624660242
25	5	834102012	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	2	1.5	3	81.566925376822
26	5	482100758	3	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	25	2	2	4	79.0832715591796
27	5	901578250	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	25	2	2	4	88.7076847047195
28	5	1151021153	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	15	2	2	4	87.8593148010273

Query executed successfully. (local),16111 (15.0 RTM) sa (59) AdventureWorks2019 00:00:00 196 rows

7. La opción final es DETAILED. Utilizar con cuidado pues puede demorar la consulta en la BD.

SQLQuery1.sql - (lo..Works2019 (sa (59)))

```
SELECT * FROM sys.dm_db_index_physical_stats(DB_ID(),NULL,NULL,NULL,'DETAILED')
ORDER BY avg_fragmentation_in_percent DESC;
```

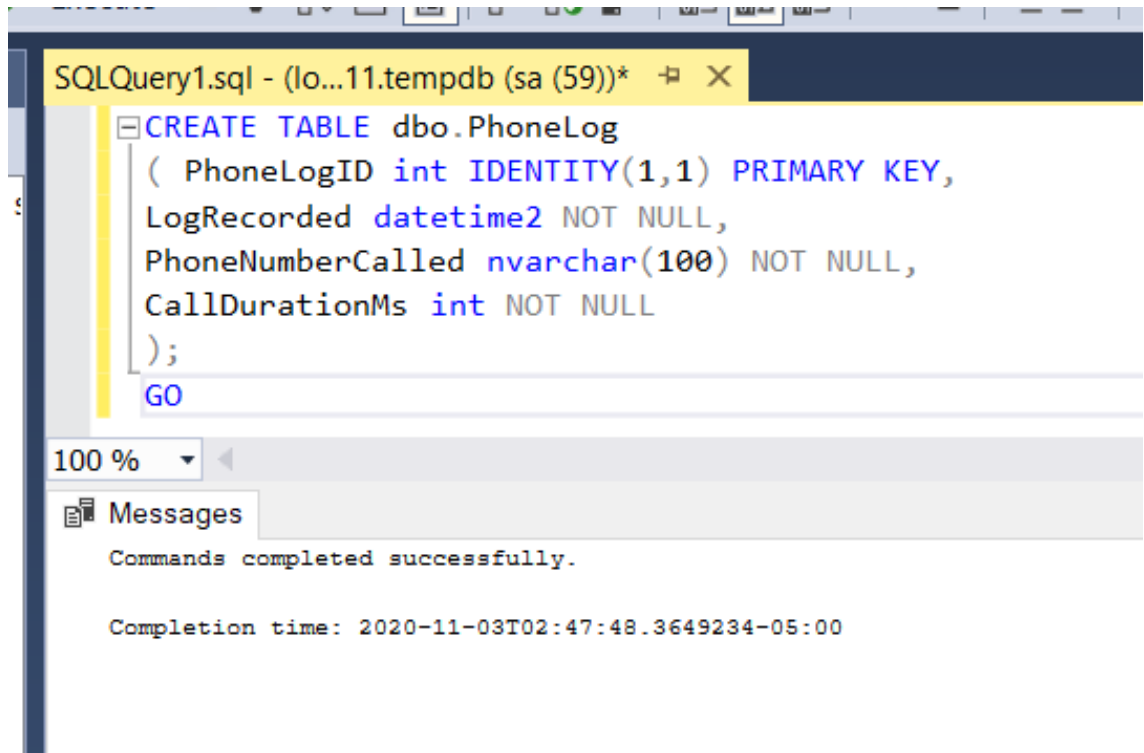
100 %

Results Messages

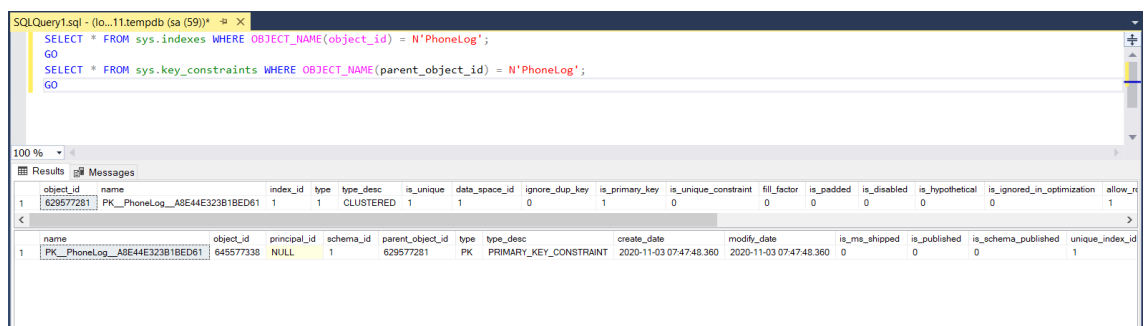
	database_id	object_id	index_id	partition_number	index_type_desc	alloc_unit_type_desc	index_depth	index_level	avg_fragmentation_in_percent	fragment_count	avg_fragment_size_in_pages	page_count	avg_page_space_used_in_per
1	5	1310627712	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	1	100	2	1	2	50.0864838151717
2	5	1922105888	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	1	100	2	1	2	54.9851742031134
3	5	274100017	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	1	87.5	8	1	8	76.4872127501853
4	5	1230627427	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	1	66.6666666666667	3	1	3	42.3770994341488
5	5	1562628651	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	1	60	5	1	5	32.8513468785505
6	5	1810105489	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	1	57.1428571428571	7	1	7	37.1509760316284
7	5	1810105489	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	3	1	50	4	1	4	35.1093402520386
8	5	1893581784	5	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	56.6963182604398
9	5	1493580359	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	53.0887076847047
10	5	1218103380	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	68.4704719545342
11	5	1266103551	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	63.466785953126
12	5	1378103950	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	56.8076117370892
13	5	1422628111	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	58.3271559179639
14	5	1493580359	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	69.2611811218186
15	5	254623950	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	53.3419817148505
16	5	2099048	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	74.153694043909
17	5	274100017	256004	1	XML INDEX	IN_ROW_DATA	3	1	50	9	1.77777777777778	16	50.5621447986163
18	5	274100017	256003	1	XML INDEX	IN_ROW_DATA	3	1	50	8	2	16	50.3822337533976
19	5	482100758	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	94.6009389671361
20	5	482100758	4	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	80.9241413392637
21	5	631673298	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	80.3434642945392
22	5	1070626857	2	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	99.6787744007907
23	5	1118627028	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	85.9154926577465
24	5	1182627256	3	1	NONCLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	60.6004447739066
25	5	2101582525	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	50	2	1	2	54.8307388188782
26	5	901578250	0	1	HEAP	IN_ROW_DATA	1	0	44.8979591836735	45	17.3777777777778	782	64.4087225105016
27	5	274100017	256002	1	XML INDEX	IN_ROW_DATA	3	1	43.75	9	1.77777777777778	16	50.5266246602422
28	5	77411784	1	1	CLUSTERED INDEX	IN_ROW_DATA	2	0	33.3333333333333	3	1.5	3	73.178814669145

Query executed successfully. (local),16111 (15.0 RTM) sa (59) AdventureWorks2019 00:00:00 312 rows

8. Utilizar la base de datos TempDB.



9. Crear una tabla con una llave primaria especificada.



10. Consultar sys.indexes para ver la estructura. En el Studio Management se puede utilizar la opción Databases, System Databases, tempdb, Tables, dbo.PhoneLog e Indexes. Show that even though no clustered index was specified, one was created automatically.

```

SQLQuery1.sql - (lo...11.tempdb (sa (59))*)
SET NOCOUNT ON;

INSERT dbo.PhoneLog (LogRecorded, PhoneNumberCalled, CallDurationMs)
VALUES(SYSDATETIME(), '999-9999', CAST(RAND() * 1000 AS int))
GO 100000 --insert dummy data, 100,000 time
  
```

100 %

Messages

Beginning execution loop
Batch execution completed 100000 times.

Completion time: 2020-11-03T03:00:10.7801613-05:00

11. Insertar algunos datos en la tabla.

```

SQLQuery1.sql - (lo...11.tempdb (sa (59))*)
SELECT * FROM sys.dm_db_index_physical_stats(DB_ID(), OBJECT_ID('dbo.PhoneLog'), NULL, NULL, 'DETAILED');
GO
  
```

100 %

Results Messages

	database_id	object_id	index_id	partition_number	index_type_desc	alloc_unit_type_desc	index_depth	index_level	avg_fragmentation_in_percent	fragment_count	avg_fragment_size_in_pages	page_count	avg_page_space_used_in_percent
1	2	629577281	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	0	0.356188780053428	143	7.85314685314685	1123	99.4855324932048
2	2	629577281	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	1	66.6666666666667	3	1	3	60.0980232270818
3	2	629577281	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	2	0	1	1	1	0.457128737336299

12. Revisar el nivel de fragmentación a través de la vista `sys.dm_db_index_physical_stats`.

SQLQuery1.sql - (lo...11.tempdb (sa (59)))

```
WHILE @Counter < 100000 BEGIN
    UPDATE dbo.PhoneLog SET PhoneNumberCalled = REPLICATE('9',CAST(RAND() * 100 AS int))
    WHERE PhoneLogID = @Counter % 100000;
    IF @Counter % 100 = 0 PRINT @Counter;
    SET @Counter += 1;
END;
GO
```

100 %

Messages

0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400

13. Verificar el porcentaje promedio de fragmentación (`avg_fragmentation_in_percent`)

SQLQuery1.sql - (lo...11.tempdb (sa (59)))

```
SELECT * FROM sys.dm_db_index_physical_stats(DB_ID(),OBJECT_ID('dbo.PhoneLog'),NULL,NULL,'DETAILED');
GO
```

100 %

Results Messages

	database_id	object_id	index_id	partition_number	index_type_desc	alloc_unit_type_desc	index_depth	index_level	avg_fragmentation_in_percent	fragment_count	avg_fragment_size_in_pages	page_count	avg_page_space_used_in_percent
1	2	629577281	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	0	64.3913920645595	2328	1.27749140893471	2974	72.0151964418087
2	2	629577281	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	1	77.7777777777778	9	1	9	53.0489004200643
3	2	629577281	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	2	0	1	1	1	1.42080553496417

Modificar los datos en la tabla - esto incrementará los datos y ocasionará fragmentación de pagina. Apreciar cuan rapido este comando se ejecuta..

14. Revisar el nivel de fragmentación a través de la vista `sys.dm_db_index_physical_stats`. Verificar el po

```
SQLQuery1.sql - (lo...11.tempdb (sa (59))) * - X
ALTER INDEX ALL ON dbo.PhoneLog REBUILD;
GO
```

100 %

Messages

Commands completed successfully.

Completion time: 2020-11-03T03:14:43.6678689-05:00

15. Reconstruir la tabla y sus indices.

```
SQLQuery1.sql - (lo...11.tempdb (sa (59))) * - X
SELECT * FROM sys.dm_db_index_physical_stats(DB_ID(),OBJECT_ID('dbo.PhoneLog'),NULL,NULL,'DETAILED');
GO
```

100 %

Results Messages

	database_id	object_id	index_id	partition_number	index_type_desc	alloc_unit_type_desc	index_depth	index_level	avg_fragmentation_in_percent	fragment_count	avg_fragment_size_in_pages	page_count	avg_page_space_used_in_percent
1	2	629577281	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	0	0.0925497454881999	206	10.4902912621359	2161	99.1176674079565
2	2	629577281	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	1	50	3	1.33333333333333	4	86.7463553249321
3	2	629577281	1	1	CLUSTERED INDEX	IN_ROW_DATA	3	2	0	1	1	1	0.617741536940944

16. Revisar el nivel de fragmentación a través de la vista `sys.dm_db_index_physical_stats`. Verificar el porcentaje de espacio libre en el disco.

[illegible]

17. Ejecutar una consulta mostrando el plan de ejecución.

SQLQuery1.sql - (lo...11.tempdb (sa (59))*)

```
SELECT [PhoneLogID]
      ,[LogRecorded]
      ,[PhoneNumberCalled]
      ,[CallDurationMs]
      ,p.Name
FROM [tempdb].[dbo].[PhoneLog] pl join [AdventureWorks2019].[Production].Product p
ON pl.CallDurationMs = p.ProductID
GO
```

100 %

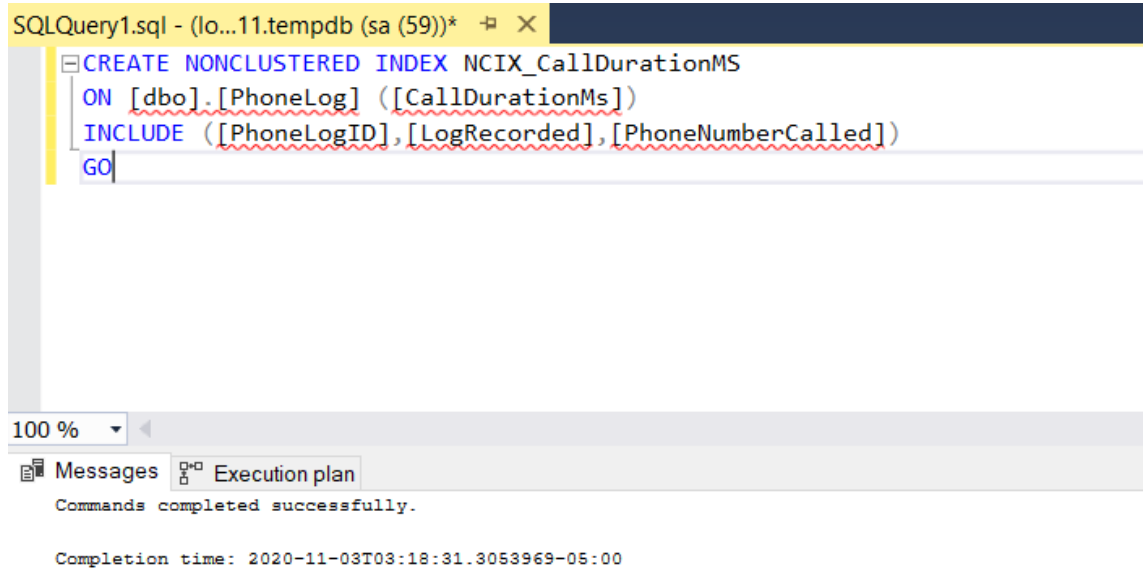
Results Messages Execution plan

Query 1: Query cost (relative to the batch): 100%

SELECT [PhoneLogID] ,[LogRecorded] ,[PhoneNumberCalled] ,[CallDurationMs] ,p.Name FROM [Missing Index (Impact 99.4609): CREATE NONCLUSTERED INDEX [<Name of Missing Index, sysna

```
graph LR
    S[SELECT  
Cost: 0 %] --> HM[Hash Match  
(Inner Join)  
Cost: 22 %  
0.002s  
101570 of  
101371 (100%)]
    IS[Index Scan (NonClustered)  
[Product].[AK_Product_Name]...  
Cost: 0 %  
0.000s  
504 of  
504 (100%)] --> HM
    CIS[Clustered Index Scan (Cluste...  
[PhoneLog].[PK_PhoneLog_A8...  
Cost: 78 %  
0.051s  
101570 of  
201001 (50%)] --> IS
```

18. Crear un índice de cobertura, apuntando a las columnas incluidas.



The screenshot shows a SQL Server Enterprise Manager window with a query editor and a results pane. The query editor contains the following SQL code:

```
SQLQuery1.sql - (lo...11.tempdb (sa (59))*) X  
CREATE NONCLUSTERED INDEX NCIX_CallDurationMS  
ON [dbo].[PhoneLog] ([CallDurationMs])  
INCLUDE ([PhoneLogID],[LogRecorded],[PhoneNumberCalled])  
GO
```

The results pane shows the following output:

```
100 %  
Messages Execution plan  
Commands completed successfully.  
Completion time: 2020-11-03T03:18:31.3053969-05:00
```

19. Ejecutar una consulta mostrando el plan de ejecución. Ahora utiliza el nuevo indice.

SQLQuery1.sql - (lo...11.tempdb (sa (59)))

```

SELECT [PhoneLogID]
      ,[LogRecorded]
      ,[PhoneNumberCalled]
      ,[CallDurationMs]
      ,p.Name
FROM [tempdb].[dbo].[PhoneLog] pl join [AdventureWorks2019].[Production].Product p
ON pl.CallDurationMs = p.ProductID
GO

```

100 %

Results Messages Execution plan

Query 1: Query cost (relative to the batch): 100%

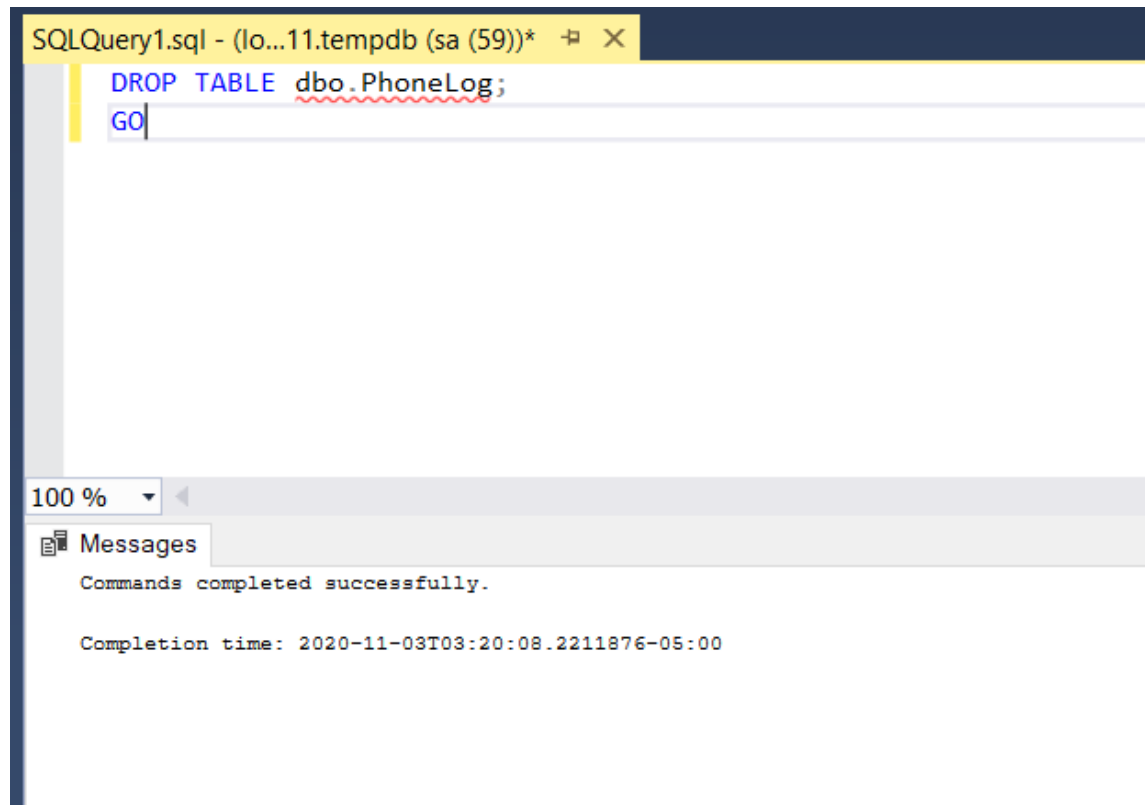
SELECT [PhoneLogID] ,[LogRecorded] ,[PhoneNumberCalled] ,[CallDurationMs] ,p.Name FROM

```

graph LR
    SELECT[SELECT  
Cost: 0 %] --> MergeJoin[Merge Join  
(Inner Join)  
Cost: 20 %  
0.064s  
101570 of  
101322 (100%)]
    ClusteredIndexScan[Clustered Index Scan (Cluste...  
[Product].[PK_Product_Produc...  
Cost: 1 %  
0.001s  
504 of  
504 (100%)] --> MergeJoin
    IndexScan[Index Scan (NonClustered)  
[PhoneLog].[NCIX_CallDuratio...  
Cost: 80 %  
0.039s  
201001 of  
201001 (100%)] --> MergeJoin

```

20. Eliminar la tabla.



21. Seleccionar nuevamente la base de datos AdventureWorks. Revisar las estadísticas de la llave primaria de la tabla Sales.SalesOrderDetail.

SQLQuery1.sql - (lo...Works2019 (sa (59)))

```
USE AdventureWorks2019;
GO

DBCC SHOW_STATISTICS ("Sales.SalesOrderDetail", PK_SalesOrderDetail_SalesOrderID_SalesOrderDetailID);
GO
```

100 %

Results Messages

	Name	Updated	Rows	Rows Sampled	Steps	Density	Average key length	String Index	Filter Expression	Unfiltered Rows	Persisted Sample Percent
1	PK_SalesOrderDetail_SalesOrderID_SalesOrderDetailID	Oct 27 2017 2:33PM	121317	121317	163	0.2703436	8	NO	NULL	121317	0

	All density	Average Length	Columns
1	3.178134E-05	4	SalesOrderID
2	8.242868E-06	8	SalesOrderID, SalesOrderDetailID

	RANGE_HI_KEY	RANGE_ROWS	EQ_ROWS	DISTINCT_RANGE_ROWS	AVG_RANGE_ROWS
1	43659	0	12	0	1
2	43692	282	28	32	8.8125
3	43898	716	28	205	3.492683
4	44079	403	27	180	2.238889
5	44288	766	34	208	3.682692
6	44488	570	27	199	2.864322
7	44538	614	35	49	12.53061
8	44570	370	32	31	11.93548
9	44758	409	27	187	2.187166
10	44801	504	26	42	12
11	45047	306	26	245	1.24898
12	45288	647	27	240	2.695833

Query executed successfully. (local),16111 (15.0 RTM) sa (59) AdventureWk

22. Ejecutar el script siguiente y verificar la estadística actualizada utilizando el plan de ejecución.

SQLQuery1.sql - (lo...Works2019 (sa (59)))

```

SELECT soh.AccountNumber
      , soh.CustomerID
      , sod.*
FROM Sales.SalesOrderDetail sod
JOIN Sales.SalesOrderHeader soh ON sod.SalesOrderID = soh.SalesOrderID;

```

100 %

Results Messages Execution plan

	AccountNumber	CustomerID	SalesOrderID	SalesOrderDetailID	CarrierTrackingNumber	OrderQty	ProductID	SpecialOfferID	UnitPrice	UnitPriceDiscount	LineTotal	rowguid	ModifiedDate
1	10-4020-000676	29825	43659	1	4911-403C-98	1	776	1	2024.994	0.00	2024.994000	B207C96D-D9E8-402B-8470-20C176C42283	2011-05-31 00:00:00.000
2	10-4020-000676	29825	43659	2	4911-403C-98	3	777	1	2024.994	0.00	6074.982000	7AB8600D-1E77-41BE-9FE5-B9142CFC08FA	2011-05-31 00:00:00.000
3	10-4020-000676	29825	43659	3	4911-403C-98	1	778	1	2024.994	0.00	2024.994000	475CF8C6-49F6-486E-B0AD-AFC6A50C0D2F	2011-05-31 00:00:00.000
4	10-4020-000676	29825	43659	4	4911-403C-98	1	771	1	2039.994	0.00	2039.994000	04C4DE91-5815-45D6-8670-F462719FBCE3	2011-05-31 00:00:00.000
5	10-4020-000676	29825	43659	5	4911-403C-98	1	772	1	2039.994	0.00	2039.994000	5A74C7D2-E641-438E-A7AC-37BF23280301	2011-05-31 00:00:00.000
6	10-4020-000676	29825	43659	6	4911-403C-98	2	773	1	2039.994	0.00	4079.988000	CE472532-A4C0-45BA-816E-EEFD3FD848B3	2011-05-31 00:00:00.000
7	10-4020-000676	29825	43659	7	4911-403C-98	1	774	1	2039.994	0.00	2039.994000	8066784D-F962-4EE3-06ED-AECA108E0D4F	2011-05-31 00:00:00.000
8	10-4020-000676	29825	43659	8	4911-403C-98	3	714	1	28.8404	0.00	86.521200	E9D54907-E787-4969-80C9-76BA69F8A336	2011-05-31 00:00:00.000
9	10-4020-000676	29825	43659	9	4911-403C-98	1	716	1	28.8404	0.00	28.840400	AA542830-8DCD-4CE5-89AD-C1BF82747725	2011-05-31 00:00:00.000
10	10-4020-000676	29825	43659	10	4911-403C-98	6	709	1	5.70	0.00	34.200000	AC769034-3C2F-495C-45A7-3B71C0B25D4E	2011-05-31 00:00:00.000
11	10-4020-000676	29825	43659	11	4911-403C-98	2	712	1	5.1865	0.00	10.373000	06A66921-469F-4199-A912-0DAFD333472B	2011-05-31 00:00:00.000
12	10-4020-000676	29825	43659	12	4911-403C-98	4	711	1	20.1865	0.00	80.746000	0E371EE3-253E-4880-8813-83C4224F972	2011-05-31 00:00:00.000
13	10-4020-000117	29672	43660	13	6431-4D57-83	1	782	1	419.4589	0.00	419.458900	419A1302-ACTA-4D44-97B2-66D9D14CD02E	2011-05-31 00:00:00.000
14	10-4020-000117	29672	43660	14	6431-4D57-83	1	758	1	874.794	0.00	874.794000	5D0B2803-1D4C-4C34-9696-C14C58E7301C	2011-05-31 00:00:00.000
15	10-4020-000442	29734	43661	15	4E0A-4F89-AE	1	745	1	809.76	0.00	809.760000	EDE1759E-6733-4C7B-A43F-DC6F48002D8A	2011-05-31 00:00:00.000
16	10-4020-000442	29734	43661	16	4E0A-4F89-AE	1	743	1	714.7043	0.00	714.704300	FE10BF09-D477-485B-9541-27AE8053A6D4	2011-05-31 00:00:00.000
17	10-4020-000442	29734	43661	17	4E0A-4F89-AE	2	747	1	714.7043	0.00	1429.408600	B136852E-24C9-4006-8048-B14AEFE6C337	2011-05-31 00:00:00.000
18	10-4020-000442	29734	43661	18	4E0A-4F89-AE	4	712	1	5.1865	0.00	20.746000	F0F410B6-BC93-4D77-B70D-E4E2465D98EE	2011-05-31 00:00:00.000
19	10-4020-000442	29734	43661	19	4E0A-4F89-AE	4	715	1	28.8404	0.00	115.361600	AE4CDA7D-9B6E-4ABB-A391-E9E9DDB10125	2011-05-31 00:00:00.000
20	10-4020-000442	29734	43661	20	4E0A-4F89-AE	2	742	1	722.5949	0.00	1445.189800	054A9D3B-A178-4656-B2B0-9B98DDF1C345	2011-05-31 00:00:00.000
21	10-4020-000442	29734	43661	21	4E0A-4F89-AE	3	775	1	2024.994	0.00	6074.982000	8C342A15-8576-4581-AAC9-78A388DBFDB8	2011-05-31 00:00:00.000
22	10-4020-000442	29734	43661	22	4E0A-4F89-AE	2	778	1	2024.994	0.00	4049.988000	B2760B75-3F1A-4DCA-A377-1051C03C8EB8	2011-05-31 00:00:00.000
23	10-4020-000442	29734	43661	23	4E0A-4F89-AE	2	711	1	20.1865	0.00	40.373000	935A70B5-33AD-473D-921C-8D2C36F0D93E	2011-05-31 00:00:00.000
24	10-4020-000442	29734	43661	24	4E0A-4F89-AE	2	741	1	818.70	0.00	1637.400000	2F911593-E388-4ACF-8757-7242004FFB8E	2011-05-31 00:00:00.000
25	10-4020-000442	29734	43661	25	4E0A-4F89-AE	4	778	1	2024.994	0.00	8099.976000	E8E15860-3A73-4507-9368-AAF827B6EE0B	2011-05-31 00:00:00.000

Query executed successfully. (local),16111 (15.0 RTM) sa (59) AdventureWorks2019 00:00:01 121,317