

ANKARA ÜNİVERSİTESİ
MÜHENDİSLİK FAKÜLTESİ
BİLGİSAYAR MÜHENDİSLİĞİ BÖLÜMÜ



AĞ TABANLI PARALEL DAĞITIM SİSTEMLERİ PROJE RAPORU

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28.05.2025

<https://github.com/BerfinSavran/Ag-Tabanli-Paralel-Dagitim-Sistemleri>

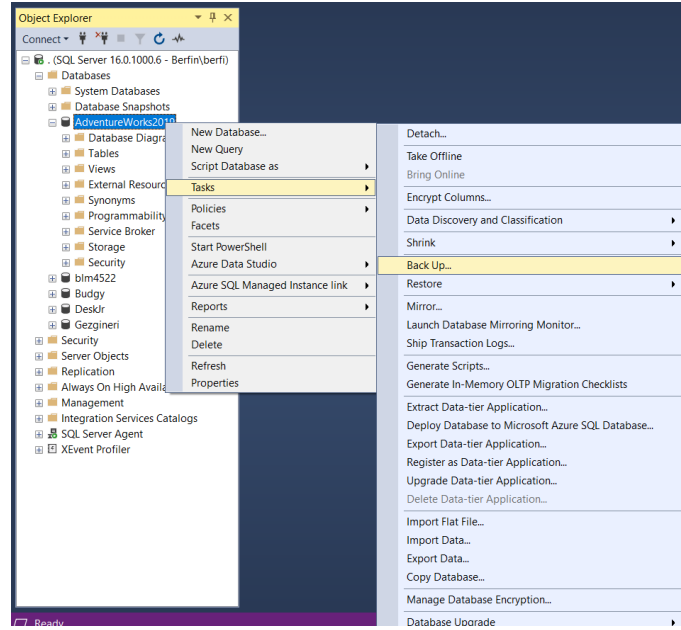
PROJE 7: VERİTABANI YEDEKLEME VE OTOMASYON ÇALIŞMASI

Adım 1: Sql Server Agent çalışıyor olmalı.

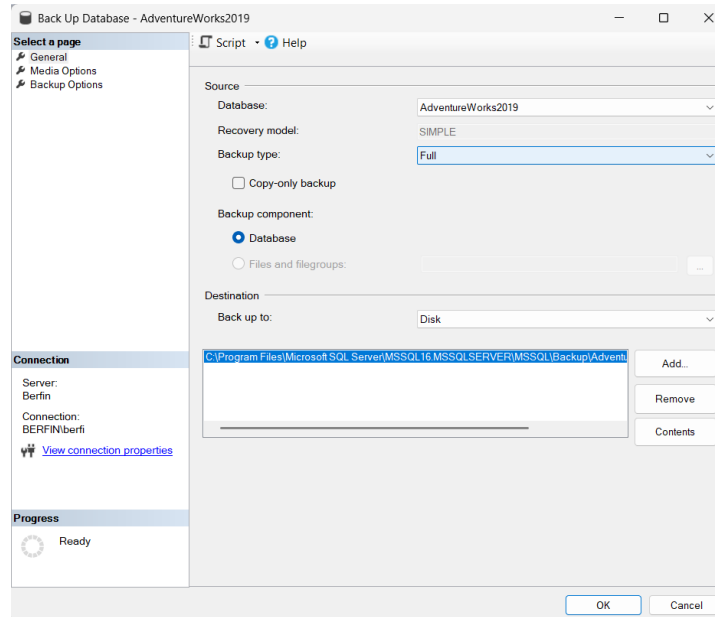
- SSMS → Object Explorer → SQL Server Agent → Yeşil mi? Eğer kapalıysa sağ tıklayıp "Start" yapıyoruz.

Adım 2: Manuel Yedekleme Alma

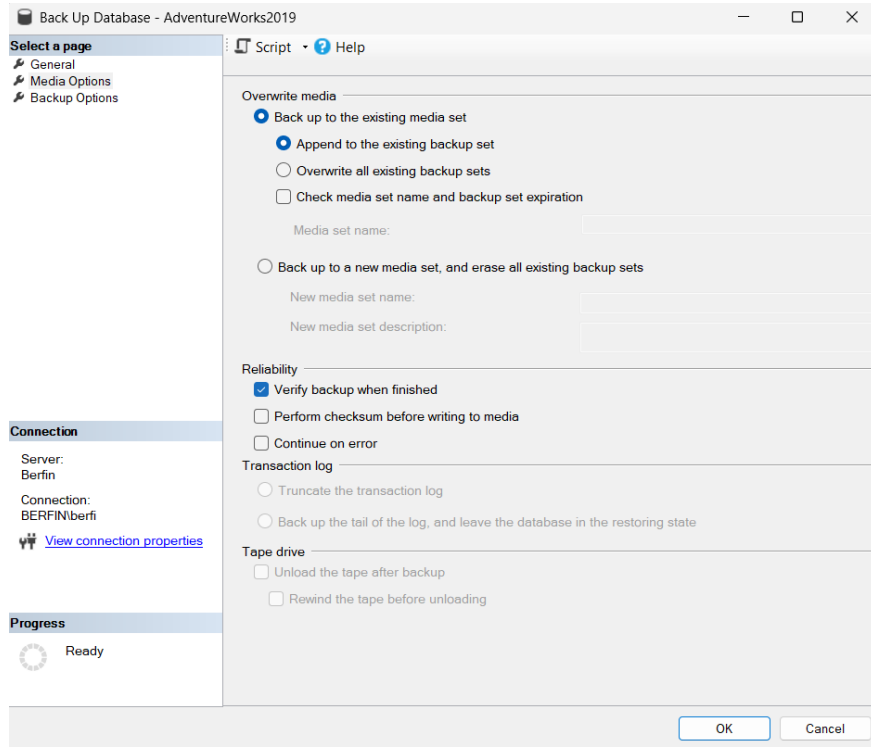
- SSMS'de AdventureWorks veritabanına sağ tıklayalım.
- Tasks > Back Up... seçeneğini seçelim.



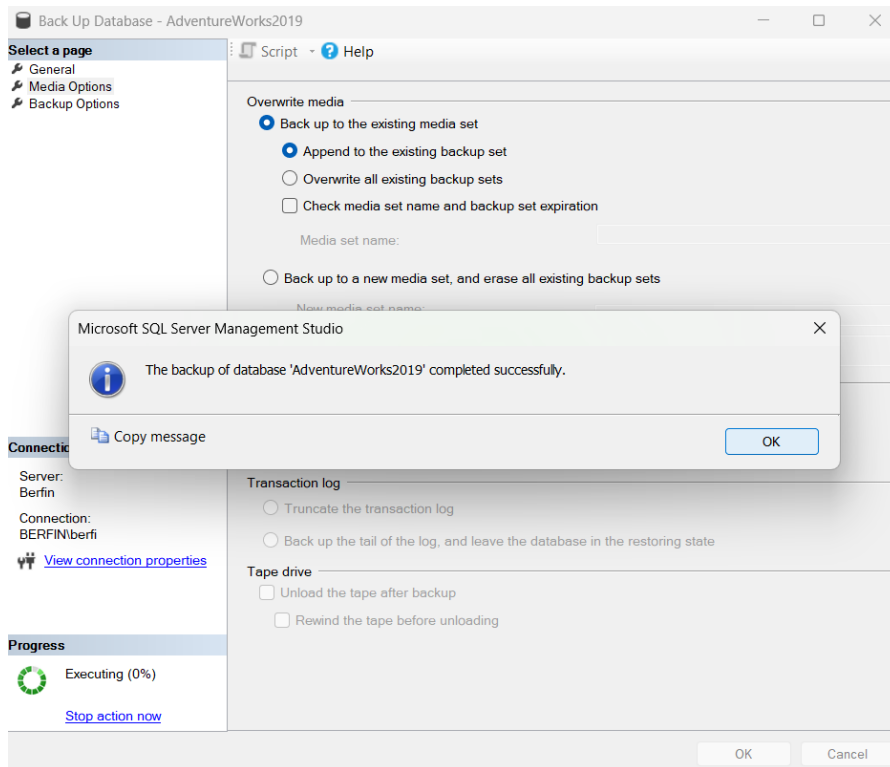
- Backup type: Full olarak ayarlayalım.
- Destination bölümünde varsayılan konumu kullanabiliriz veya yeni bir konum ekleyebiliriz.



- Options sayfasında "Verify backup when finished" seçeneğini işaretleyelim.

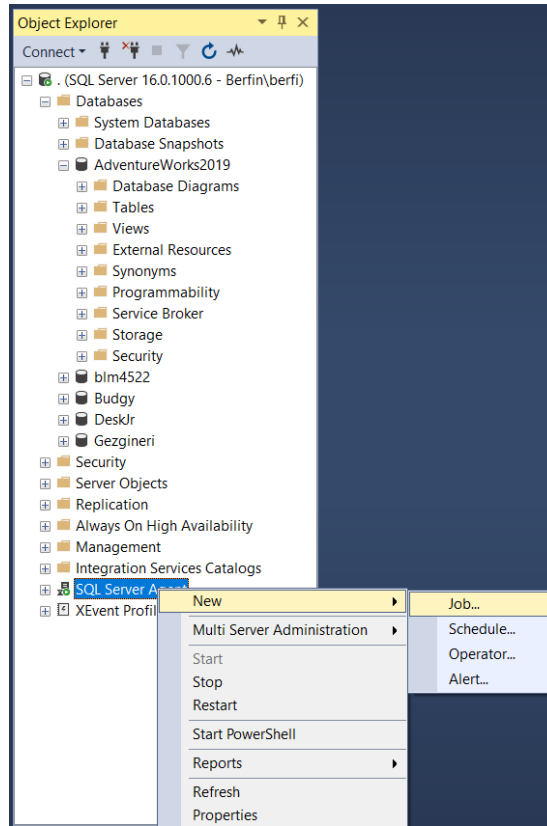


- OK'e tıklayarak tam yedeği alabiliriz.

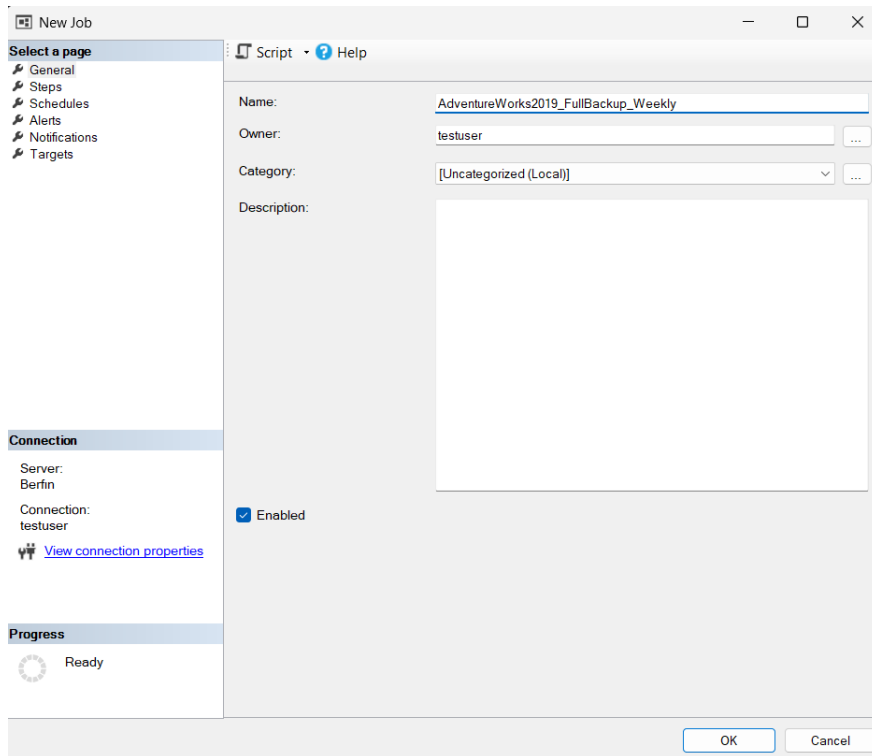


Adım 3: Full Backup Almak (Tam Yedekleme)

- SQL Server Agent'a sağ tıklayalım ve "New > Job" seçeneğini seçelim.



- Genel sekmesinde iş için bir ad verelim
"AdventureWorks2019_FullBackup_Weekly"



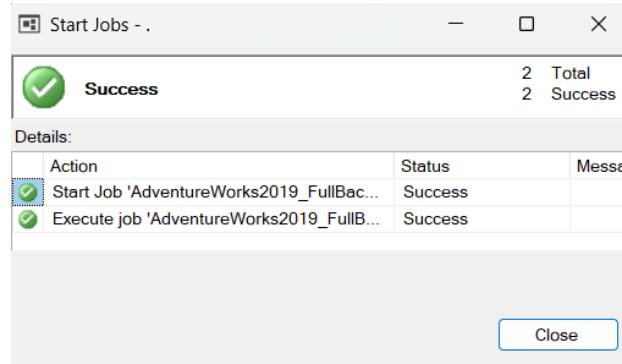
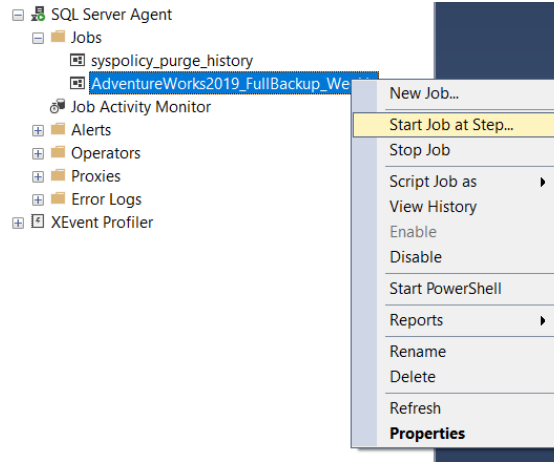
- Steps sekmesinde "New" düğmesine tıklayalım.
- Step adı olarak "Full Backup" girelim.

- Type olarak "Transact-SQL script (T-SQL)" seçelim.
- T-SQL kodunu girelim ve OK tıklayalım.

- Schedules sekmesine gidedim ve "New" düğmesine tıklayalım.
- Haftalık bir zamanlama oluşturalım (her Pazar günü saat 00:00 olsun).

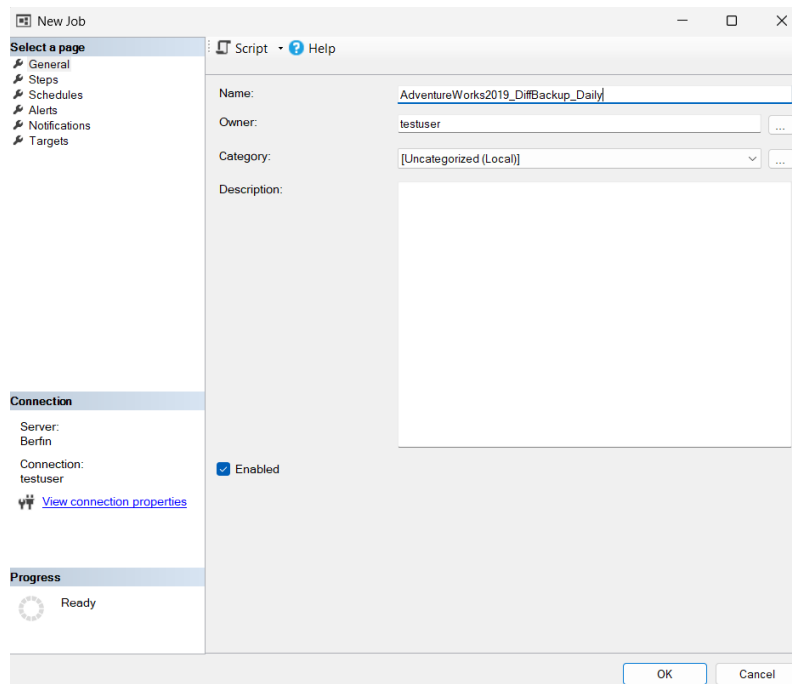
- OK'e tıklayarak programı kaydedelim.
- OK'e tıklayarak işi kaydedelim.

- Şimdi de test edelim.
- Oluşturduğumuz job üzerinde sağ tıklayıp "Start Job at Step" tıklayalım.



Adım 4: Fark Yedeklemesi İçin Job Oluşturma

- Aynı adımları tekrarlayalım.
- Job adı: "AdventureWorks2019_DiffBackup_Daily"



- Step adı: "Differential Backup"

New Job Step

Select a page
 General
 Advanced

Script ? Help

Step name: Differential Backup

Type: Transact-SQL script (T-SQL)

Run as:

Database: master

Command:

```
BACKUP DATABASE AdventureWorks2019
TO DISK = C:\Program Files\Microsoft SQL Server\MSSQL16\MSSQLSERVER\MS
WITH DIFFERENTIAL, INIT, NAME = 'AdventureWorks2019 Differential Backup', S
```

Open...
 Select All
 Copy
 Paste
 Parse

Connection

Server: Berfin
 Connection: testuser
[View connection properties](#)

Progress

Ready

Previous Next

OK Cancel

- Zamanlama: Her gün (Pazartesi'den Cumartesi'ye, saat 20:00)

New Job Schedule

Name: Differential Jobs in Schedule

Schedule type: Recurring ☒ Enabled

One-time occurrence

Date: 26.04.2025 Time: 10:59:57

Frequency

Occurs: Weekly

Recurs every: 1 week(s) on

☒ Monday ☒ Wednesday ☒ Friday ☒ Saturday
☒ Tuesday ☒ Thursday ☐ Sunday

Daily frequency

☒ Occurs once at: 20:00:00
☐ Occurs every: 1 hour(s)

Starting at: 00:00:00
 Ending at: 23:59:59

Duration

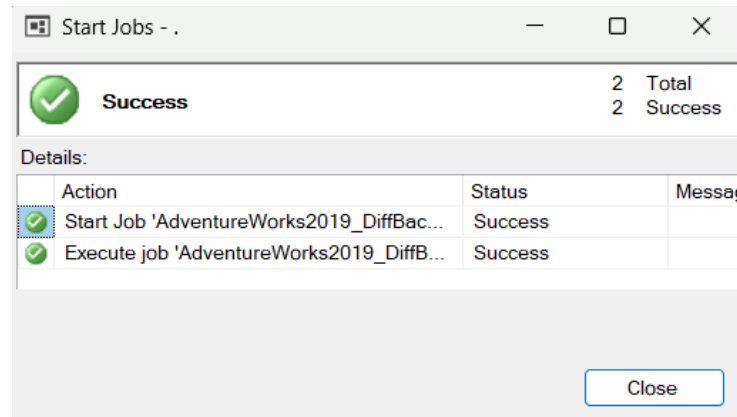
Start date: 26.04.2025 ☐ End date: 26.04.2025
☒ No end date

Summary

Description: Occurs every week on Monday, Tuesday, Wednesday, Thursday, Friday, Saturday at 20:00:00. Schedule will be used starting on 26.04.2025.

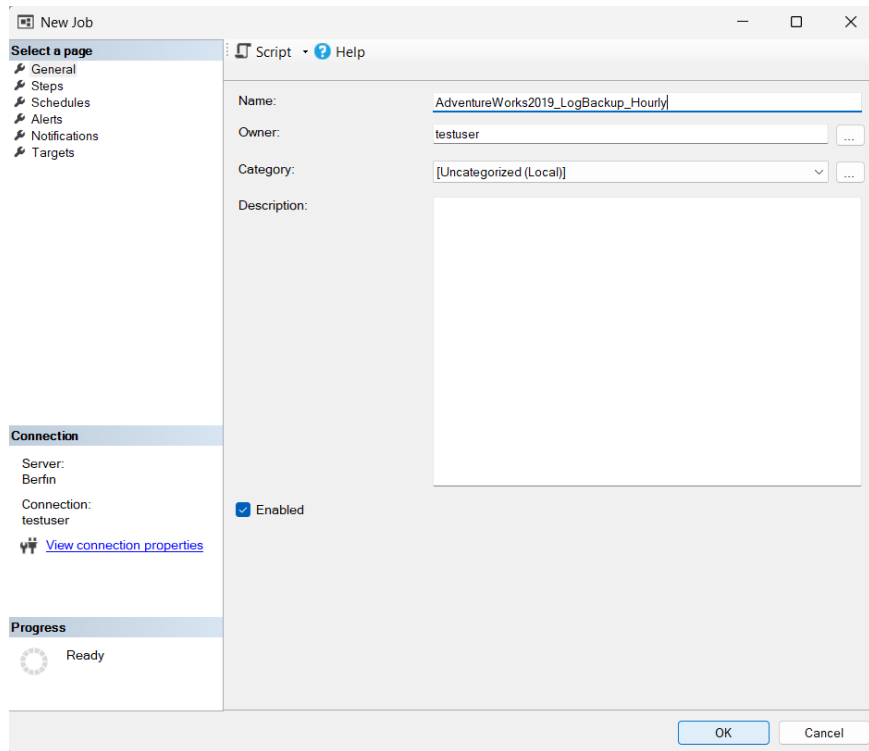
OK Cancel Help

- Test edelim.



Adım 5: İşlem Günlüğü Yedeklemesi İçin Job Oluşturma

- Yine aynı adımları tekrarlayalım.
- Job adı: "AdventureWorks2019_LogBackup_Hourly"



- Step adı: "Transaction Log Backup"

New Job Step

Select a page

- General
- Advanced

Script ? Help

Step name: Transaction Log Backup

Type: Transact-SQL script (T-SQL)

Run as:

Database: master

Command: BACKUP LOG AdventureWorks2019 TO DISK = 'C:\Program Files\Microsoft SQL Server\MSSQL16.MSSQLSERVER\M...' WITH INIT, NAME = 'AdventureWorks2019 Hourly Transaction Log Backup', SKIP, ...

Open... Select All Copy Paste Parse

Server: Berlin

Connection: testuser

[View connection properties](#)

Progress

Ready

Previous Next

OK Cancel

- Zamanlama: Her saat (00-23, her gün)

New Job Schedule

Name: Daily

Jobs in Schedule

Schedule type: Recurring

Enabled

One-time occurrence

Date: 26.04.2025 Time: 11:10:03

Frequency

Occurs: Daily

Recurs every: 1 day(s)

Daily frequency

Occurs once at: 00:00:00

Occurs every: 1 hour(s)

Starting at: 00:00:00

Ending at: 23:00:00

Duration

Start date: 26.04.2025

End date: 26.04.2025

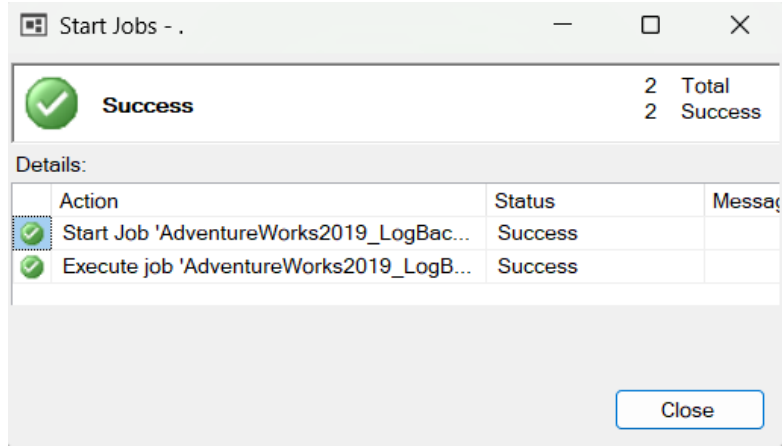
No end date:

Summary

Description: Occurs every day every 1 hour(s) between 00:00:00 and 23:00:00. Schedule will be used starting on 26.04.2025.

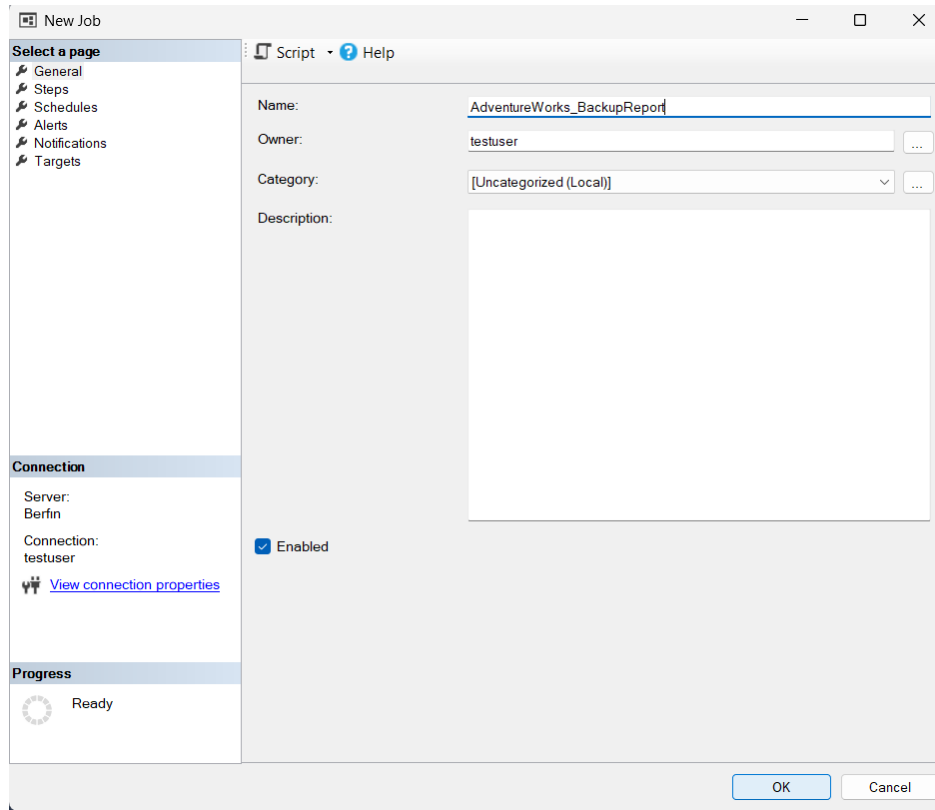
OK Cancel Help

- Öncesinde Full Backup alalım.
- Test edelim.



Adım 6: Yedekleme Raporlama Job'ı Oluşturma

- Job adı: "AdventureWorks_BackupReport"



- Step adı: "Generate Backup Report"

New Job Step

Select a page: General, Advanced

Script Help

Step name: Generate Backup Report

Type: Transact-SQL script (T-SQL)

Run as:

Database: master

Command:

```
SELECT
  database_name,
  backup_start_date,
  backup_finish_date,
  CASE backup_type
    WHEN 'D' THEN 'Full Database Backup'
    WHEN 'I' THEN 'Differential Database Backup'
    WHEN 'L' THEN 'Transaction Log Backup'
    ELSE 'Other'
  END AS backup_type,
  backup_size / 1024 / 1024 AS backup_size_MB,
  physical_device_name
FROM msdb.dbo.backupset bs
INNER JOIN msdb.dbo.backupmediafamily bmf ON bs.media_set_id = bmf.media_set_id
WHERE database_name = 'AdventureWorks2019'
ORDER BY backup_finish_date DESC;
```

Open... Select All Copy Paste Parse

Previous Next

OK Cancel

- Zamanlama: Her gün saat 09:00'da çalışsın.

New Job Schedule

Name: Backup Report Jobs in Schedule

Schedule type: Recurring Enabled

One-time occurrence

Date: 26.04.2025 Time: 11:26:45

Frequency

Occurs: Daily

Recurs every: 1 day(s)

Daily frequency

Occurs once at: 09:00:00

Occurs every: 1 hour(s) Starting at: 00:00:00 Ending at: 23:59:59

Duration

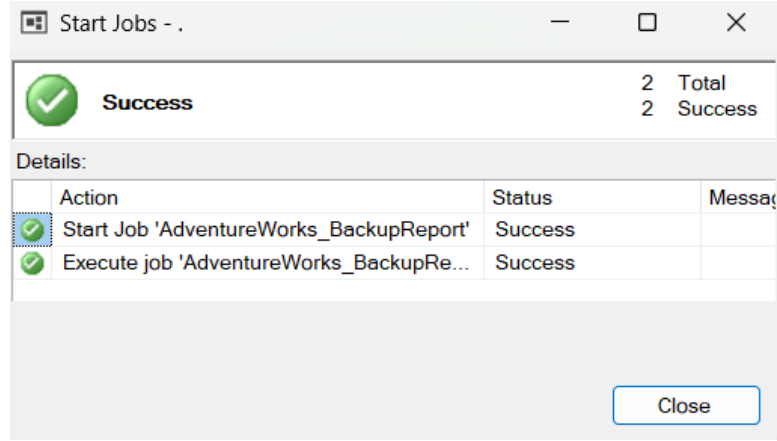
Start date: 26.04.2025 End date: 26.04.2025 No end date

Summary

Description: Occurs every day at 09:00:00. Schedule will be used starting on 26.04.2025.

OK Cancel Help

- Test edelim.

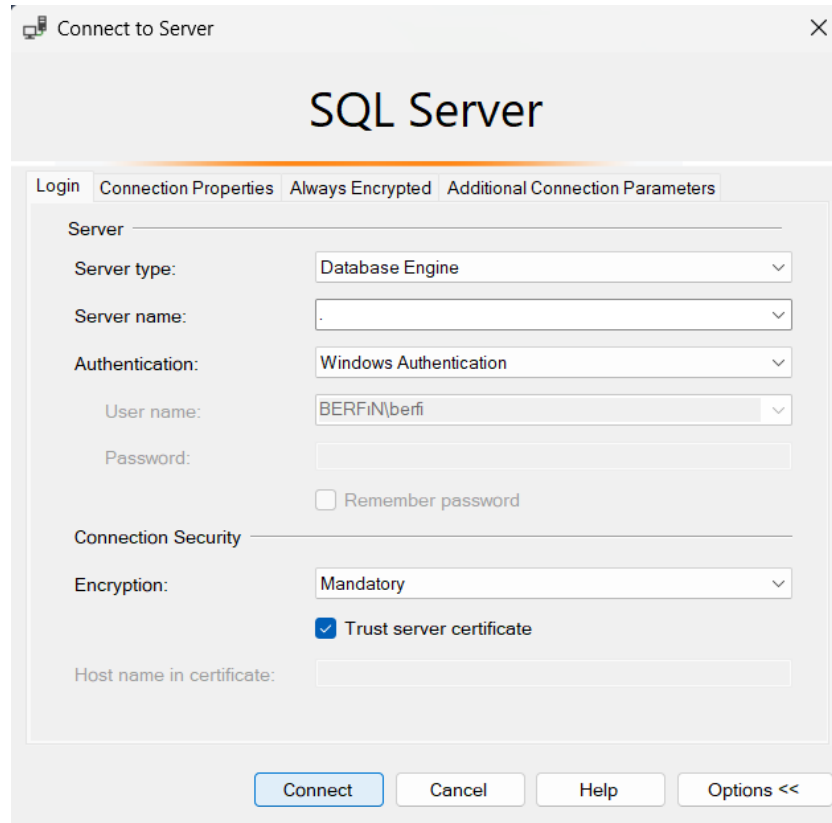


	database_name	backup_start_date	backup_finish_date	backup_type	backup_size_MB	physical_device_name
1	AdventureWorks2019	2025-04-26 11:21:11.000	2025-04-26 11:21:11.000	Transaction Log Backup	0.08203125000	C:\Program Files\Microsoft SQL Server\MSSQL16.MSS...
2	AdventureWorks2019	2025-04-26 11:19:50.000	2025-04-26 11:19:51.000	Full Database Backup	201.08593750000	C:\Program Files\Microsoft SQL Server\MSSQL16.MSS...
3	AdventureWorks2019	2025-04-26 11:03:54.000	2025-04-26 11:03:54.000	Differential Database Backup	2.08984375000	C:\Program Files\Microsoft SQL Server\MSSQL16.MSS...
4	AdventureWorks2019	2025-04-26 10:54:23.000	2025-04-26 10:54:23.000	Full Database Backup	201.08984375000	C:\Program Files\Microsoft SQL Server\MSSQL16.MSS...
5	AdventureWorks2019	2025-04-24 14:14:10.000	2025-04-24 14:14:10.000	Full Database Backup	199.92578125000	C:\Program Files\Microsoft SQL Server\MSSQL16.MSS...
6	AdventureWorks2019	2025-04-22 11:37:43.000	2025-04-22 11:37:43.000	Full Database Backup	200.08593750000	C:\Program Files\Microsoft SQL Server\MSSQL16.MSS...
7	AdventureWorks2019	2023-05-08 12:08:45.000	2023-05-08 12:08:45.000	Full Database Backup	199.08593750000	C:\Program Files\Microsoft SQL Server\MSSQL16.MSS...

PROJE 3: VERİTABANI GÜVENLİĞİ VE ERIŞİM KONTROLÜ

Adım 1: Erişim Yönetimi: Kullanıcı Erişimi ve Yetkilendirme

- Windows Authentication ile giriş yapalım.



- Windows Authentication kullanıldığında:
 - SQL Server, kullanıcı kimliğini Windows işletim sistemi üzerinden doğrular.
(Yani Windows'a nasıl giriş yaptıysak, SQL Server o oturumu kullanır.)
 - Eğer Windows hesabımız SQL Server'da yetkiliyse, tekrar şifre yazmadan giriş yaparız.
 - Şifreler SQL Server'e taşınmaz. Kimlik doğrulama doğrudan Windows üzerinde yapılır. Daha güvenlidir.
(Saldırgan SQL Server'e erişse bile Windows şifresini bilemez.)
- SQL Server Authentication kullanarak yeni kullanıcı (Login) oluşturalım.
- Kullanıcıyı AdventureWorks2019 veritabanına ekleyelim.

```
CREATE LOGIN testuser WITH PASSWORD = 'StrongPassword123';  
CREATE USER testuser FOR LOGIN testuser;
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-04-22T13:11:35.2074824+03:00

- Giriş yapabiliyor muyuz test edelim.

Connect to Server

SQL Server

Login | Connection Properties | Always Encrypted | Additional Connection Parameters

Server

Server type: Database Engine

Server name: .

Authentication: SQL Server Authentication

Login: testuser

Password: *****

☐ Remember password

Connection Security

Encryption: Mandatory

☒ Trust server certificate

Host name in certificate:

Connect Cancel Help Options <<

Adım 2: Kullanıcıya Yetki Verme

- db_datareader: Veritabanındaki tüm verileri okuma yetkisi verelim.
- db_datawriter: Veritabanındaki tüm tablolara yazma (insert, update, delete) yetkisi verelim.

```
USE AdventureWorks2019;  
EXEC sp_addrolemember 'db_datareader', 'testuser'; -- Veritabanı okuma yetkisi verir
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-04-22T13:18:20.0053104+03:00

```
USE AdventureWorks2019;  
EXEC sp_addrolemember 'db_datawriter', 'testuser'; -- Veritabanı yazma yetkisi verir
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-04-26T11:55:32.7470611+03:00

Adım 3: Veri Şifreleme: Transparent Data Encryption (TDE)

- Master Key oluşturalım.
- Bu, ana anahtardır. Şifrelenmiş sertifikalar gibi üst düzey şifrelemeler için kullanılır.

```
USE master;  
GO  
  
CREATE MASTER KEY ENCRYPTION BY PASSWORD = 'StrongPassword123!';
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-04-22T13:20:46.7309387+03:00

- Sertifika oluşturalım.
- Bu sertifika, şifreleme işlemleri için kullanılacaktır.

```
CREATE CERTIFICATE TDECertificate
WITH SUBJECT = 'TDE Certificate for AdventureWorks2019';
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-04-22T13:21:23.1184550+03:00

- Veritabanında şifrelemeyi aktif edelim.
- Bu adımda TDECertificate ile veritabanına bir şifreleme anahtarı tanımlıyoruz.

```
USE AdventureWorks2019;
GO

CREATE DATABASE ENCRYPTION KEY
WITH ALGORITHM = AES_256
ENCRYPTION BY SERVER CERTIFICATE TDECertificate;
```

- Şifreleme işlemini başlatalım.
- 3 = Şifreleme aktif.

```
SELECT db.name, dm.encryption_state, dm.percent_complete, dm.key_algorithm, dm.key_length
FROM sys.dm_database_encryption_keys dm
JOIN sys.databases db
ON dm.database_id = db.database_id;
```

100 %

Results Messages

	name	encryption_state	percent_complete	key_algorithm	key_length
1	tempdb	3	0	AES	256
2	AdventureWorks2019	3	0	AES	256

Adım 4: Basit Bir SQL Injection Zafiyeti Simülasyonu

- Hazırlık: Test için geçici bir tablo oluşturalım.


```
USE AdventureWorks2019;
GO

CREATE TABLE InjectionTest (
    Id INT PRIMARY KEY IDENTITY(1,1),
    Username NVARCHAR(100),
    Password NVARCHAR(100)
);

INSERT INTO InjectionTest (Username, Password) VALUES
('admin', '1234'),
('user1', 'pass1'),
('testuser', 'mypassword');
```

100 %

Messages

(3 rows affected)

Completion time: 2025-04-22T13:24:54.3561236+03:00

- Zayıf ve Güvensiz Sorgu Örneği (Klasik Injection)

```
DECLARE @username NVARCHAR(100) = 'admin' --';
DECLARE @sql NVARCHAR(MAX) =
    'SELECT * FROM InjectionTest WHERE Username = ''' + @username + '''';

EXEC(@sql);
```

100 %

Results Messages

	Id	Username	Password
1	1	admin	1234

- SQL Injection'dan Korunma (Parametrik Sorgu)

```
DECLARE @username NVARCHAR(100) = 'admin' --';
DECLARE @stmt NVARCHAR(MAX) = N'SELECT * FROM InjectionTest WHERE Username = @u';
EXEC sp_executesql @stmt, N'@u NVARCHAR(100)', @u = @username;
```

100 %

Results Messages

	Id	Username	Password
--	----	----------	----------

Adım 5 : SQL Server Audit ile Kullanıcı İzleme (Audit Log)

- Audit nesnesi oluşturalım.

```
USE master;
GO

CREATE SERVER AUDIT Audit_TestUser_Logins
TO FILE (
    FILEPATH = 'C:\SQLAuditLogs\', -- Bu klasör var olmalı!
    MAXSIZE = 5 MB,
    MAX_ROLLOVER_FILES = 10,
    RESERVE_DISK_SPACE = OFF
);
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-04-22T13:27:46.8049004+03:00

- Audit eylemini (Action Group) tanımlayalım.

```
CREATE SERVER AUDIT SPECIFICATION Audit_Logins_Spec
FOR SERVER AUDIT Audit_TestUser_Logins
ADD (SUCCESSFUL_LOGIN_GROUP),
ADD (FAILED_LOGIN_GROUP);
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-04-26T12:12:38.1041743+03:00

- Audit'i başlatalım.

```
ALTER SERVER AUDIT Audit_TestUser_Logins WITH (STATE = ON);
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-04-22T13:28:37.9150682+03:00

- Önce yanlış giriş yapalım.

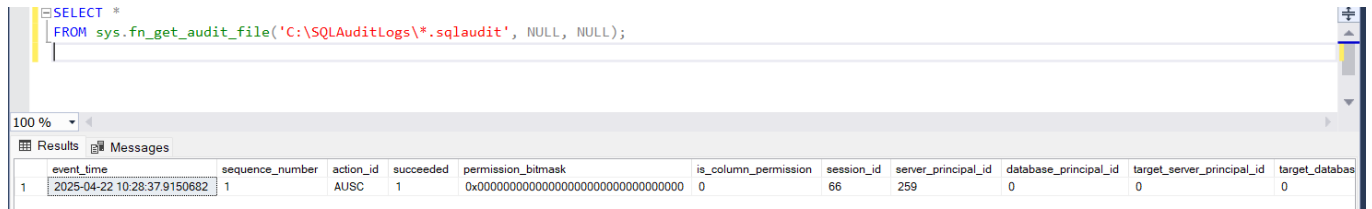
The image shows the 'Connect to Server' dialog box for SQL Server. The 'Login' tab is selected. The 'Server' section shows 'Server type' as 'Database Engine', 'Server name' as '.', 'Authentication' as 'SQL Server Authentication', 'Login' as 'testuser', and 'Password' as a masked field. The 'Connection Security' section shows 'Encryption' as 'Mandatory' and 'Trust server certificate' checked. The 'Host name in certificate' field is empty. The 'Connect' button is highlighted in blue.

The image shows an error message dialog box titled 'Connect to Server'. It contains a red 'X' icon and the text 'Cannot connect to ..'. Below this, it says 'Additional information:' followed by 'Login failed for user 'testuser'. (Microsoft SQL Server, Error: 18456)'. At the bottom, there are buttons for 'Help', 'Copy message', 'Show details', and 'OK'.

- Şimdi de doğru giriş yapalım.

The image shows the 'Connect to Server' dialog box for SQL Server, identical to the one above. The 'Login' tab is selected. The 'Server' section shows 'Server type' as 'Database Engine', 'Server name' as '.', 'Authentication' as 'SQL Server Authentication', 'Login' as 'testuser', and 'Password' as a masked field. The 'Connection Security' section shows 'Encryption' as 'Mandatory' and 'Trust server certificate' checked. The 'Host name in certificate' field is empty. The 'Connect' button is highlighted in blue.

- Audit loglarını görüntüleyelim.



event_time	sequence_number	action_id	succeeded	permission_bitmask	is_column_permission	session_id	server_principal_id	database_principal_id	target_server_principal_id	target_databas
2025-04-22 10:28:37.9150682	1	AUSC	1	0x00000000000000000000000000000000	0	66	259	0	0	0

- Audit'i devre dışı bırakalım.

```
ALTER SERVER AUDIT Audit_TestUser_Logins WITH (STATE = OFF);
DROP SERVER AUDIT SPECIFICATION Audit_Logins_Spec;
DROP SERVER AUDIT Audit_TestUser_Logins;
```

Messages

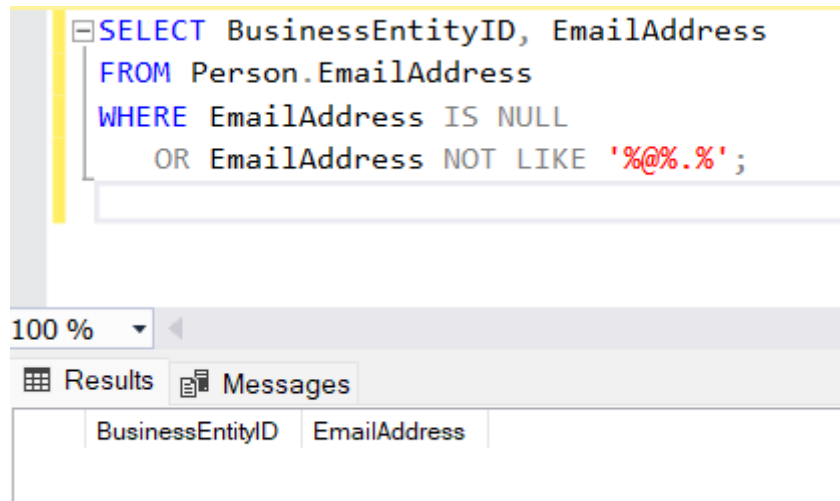
Commands completed successfully.

Completion time: 2025-04-22T13:31:06.0271010+03:00

PROJE 5: VERİ TEMZİLEME VE ETL SÜREÇLERİ TASARIMI

Adım 1: Hatalı Verileri Tespit Etme

- E-poste verilerinde hatalı veriler var mı kontrol edelim.



```
SELECT BusinessEntityID, EmailAddress
FROM Person.EmailAddress
WHERE EmailAddress IS NULL
OR EmailAddress NOT LIKE '%@%.%';
```

BusinessEntityID	EmailAddress
------------------	--------------

- Person.EmailAddress tablosunda yapılan sorguda NULL veya yanlış formatlı e-posta adresi bulunmamıştır. Veriler bu açıdan temiz durumdadır.
- Telefon numaralarındaki formatları kontrol edelim.

<pre> SELECT BusinessEntityID, PhoneNumber FROM Person.PersonPhone WHERE PhoneNumber NOT LIKE '[0-9][0-9][0-9]-%'; </pre>		
100 %		
Results Messages		
	BusinessEntityID	PhoneNumber
1	1959	1 (11) 500 555-0110
2	2409	1 (11) 500 555-0110
3	2467	1 (11) 500 555-0110
4	2488	1 (11) 500 555-0110
5	2510	1 (11) 500 555-0110
6	2553	1 (11) 500 555-0110
7	2621	1 (11) 500 555-0110
8	2625	1 (11) 500 555-0110
9	3637	1 (11) 500 555-0110
10	3843	1 (11) 500 555-0110
11	3884	1 (11) 500 555-0110
12	4341	1 (11) 500 555-0110
13	4348	1 (11) 500 555-0110
14	4511	1 (11) 500 555-0110
15	4651	1 (11) 500 555-0110
16	4772	1 (11) 500 555-0110
17	4871	1 (11) 500 555-0110
18	4920	1 (11) 500 555-0110
19	4973	1 (11) 500 555-0110
20	5239	1 (11) 500 555-0110
21	5303	1 (11) 500 555-0110
22	5454	1 (11) 500 555-0110
23	5851	1 (11) 500 555-0110
24	6089	1 (11) 500 555-0110
25	6117	1 (11) 500 555-0110
26	6134	1 (11) 500 555-0110
27	6182	1 (11) 500 555-0110
28	6404	1 (11) 500 555-0110
29	6542	1 (11) 500 555-0110
30	6544	1 (11) 500 555-0110
31	6802	1 (11) 500 555-0110

- Person.PersonPhone tablosunda yer alan telefon numaralarının bir kısmı belirlenen format (XXX-XXX-XXXX) ile uyumlu değildir. Yapılan sorgu sonucu, standart dışı formatta birçok kayıt tespit edilmiştir.

Adım 2: Geçici Tablo Oluştur ve Hatalı Verileri Aktar

- Geçici tablo oluşturalım.

<pre> CREATE TABLE #CleanedPhones (BusinessEntityID INT, OriginalPhone NVARCHAR(50), CleanedPhone NVARCHAR(50)); </pre>	
100 %	
Messages	
Commands completed successfully.	
Completion time: 2025-04-24T14:33:52.0375503+03:00	

- Hatalı verileri aktaralım.

```

INSERT INTO #CleanedPhones (BusinessEntityID, OriginalPhone)
SELECT BusinessEntityID, PhoneNumber
FROM Person.PersonPhone
WHERE PhoneNumber NOT LIKE '[0-9][0-9][0-9]-%';

```

100 %

Messages

(9188 rows affected)

Completion time: 2025-04-24T14:34:09.3275579+03:00

Adım 4: Temiz Telefon Formatı Oluşturma (Transform) (Standart Formata Dönüştürme)

- Temizlenecek sütun ekleyelim.

```

ALTER TABLE #CleanedPhones ADD DigitsOnly NVARCHAR(20);

```

100 %

Messages

Commands completed successfully.

Completion time: 2025-04-24T14:36:48.7530346+03:00

- Parantez, boşluk ve tireleri temizleyelim.

```

UPDATE #CleanedPhones
SET DigitsOnly = REPLACE(
    REPLACE(
        REPLACE(
            REPLACE(OriginalPhone, '(', ''),
            ')', ''),
        '-', ''),
    ' ', '');

```

100 %

Messages

(9188 rows affected)

Completion time: 2025-04-24T14:38:07.1011763+03:00

- İlk 10 haneyi alıp XXX-XXX-XXXX formatına çevirelim.

```
UPDATE #CleanedPhones
SET CleanedPhone =
STUFF(
    STUFF(
        SUBSTRING(DigitsOnly, LEN(DigitsOnly)-9, 10),
        4, 0, '-'
    ),
    8, 0, '-'
)
WHERE LEN(DigitsOnly) >= 10;
```

100 %

Messages

(9188 rows affected)

Completion time: 2025-04-24T14:38:47.0325972+03:00

- Sonucu kontrol edelim.

```
SELECT * FROM #CleanedPhones;
```

100 %

Results Messages

	BusinessEntityID	OriginalPhone	CleanedPhone	DigitsOnly
1	1959	1 (11) 500 555-0110	500-555-0110	1115005550110
2	2409	1 (11) 500 555-0110	500-555-0110	1115005550110
3	2467	1 (11) 500 555-0110	500-555-0110	1115005550110
4	2488	1 (11) 500 555-0110	500-555-0110	1115005550110
5	2510	1 (11) 500 555-0110	500-555-0110	1115005550110
6	2553	1 (11) 500 555-0110	500-555-0110	1115005550110
7	2621	1 (11) 500 555-0110	500-555-0110	1115005550110
8	2625	1 (11) 500 555-0110	500-555-0110	1115005550110
9	3637	1 (11) 500 555-0110	500-555-0110	1115005550110
10	3843	1 (11) 500 555-0110	500-555-0110	1115005550110
11	3884	1 (11) 500 555-0110	500-555-0110	1115005550110
12	4341	1 (11) 500 555-0110	500-555-0110	1115005550110
13	4348	1 (11) 500 555-0110	500-555-0110	1115005550110
14	4511	1 (11) 500 555-0110	500-555-0110	1115005550110
15	4651	1 (11) 500 555-0110	500-555-0110	1115005550110
16	4772	1 (11) 500 555-0110	500-555-0110	1115005550110
17	4871	1 (11) 500 555-0110	500-555-0110	1115005550110
18	4920	1 (11) 500 555-0110	500-555-0110	1115005550110
19	4973	1 (11) 500 555-0110	500-555-0110	1115005550110
20	5239	1 (11) 500 555-0110	500-555-0110	1115005550110
21	5303	1 (11) 500 555-0110	500-555-0110	1115005550110
22	5454	1 (11) 500 555-0110	500-555-0110	1115005550110
23	5851	1 (11) 500 555-0110	500-555-0110	1115005550110
24	6089	1 (11) 500 555-0110	500-555-0110	1115005550110
25	6117	1 (11) 500 555-0110	500-555-0110	1115005550110
26	6134	1 (11) 500 555-0110	500-555-0110	1115005550110
27	6182	1 (11) 500 555-0110	500-555-0110	1115005550110
28	6404	1 (11) 500 555-0110	500-555-0110	1115005550110
29	6542	1 (11) 500 555-0110	500-555-0110	1115005550110
30	6544	1 (11) 500 555-0110	500-555-0110	1115005550110
31	6802	1 (11) 500 555-0110	500-555-0110	1115005550110
32	6896	1 (11) 500 555-0110	500-555-0110	1115005550110

Adım 5: Temiz Verileri Yeni Bir Kalıcı Tabloya Yükleme

- Yeni tablo oluşturalım.

```
CREATE TABLE Person.CleanedPersonPhone (
    BusinessEntityID INT,
    CleanedPhone NVARCHAR(50)
);
```

100 %

Messages

Commands completed successfully.

Completion time: 2025-04-24T14:39:59.0444978+03:00

- Temiz verileri bu tabloya aktaralım.

```
INSERT INTO Person.CleanedPersonPhone (BusinessEntityID, CleanedPhone)
SELECT BusinessEntityID, CleanedPhone
FROM #CleanedPhones
WHERE CleanedPhone IS NOT NULL;
```

100 %

Messages

(9188 rows affected)

Completion time: 2025-04-24T14:40:50.5929792+03:00

Adım 6: Son Kontrol – Yüklenen Veriyi Göster

```
SELECT * FROM Person.CleanedPersonPhone;
```

100 %

Results Messages

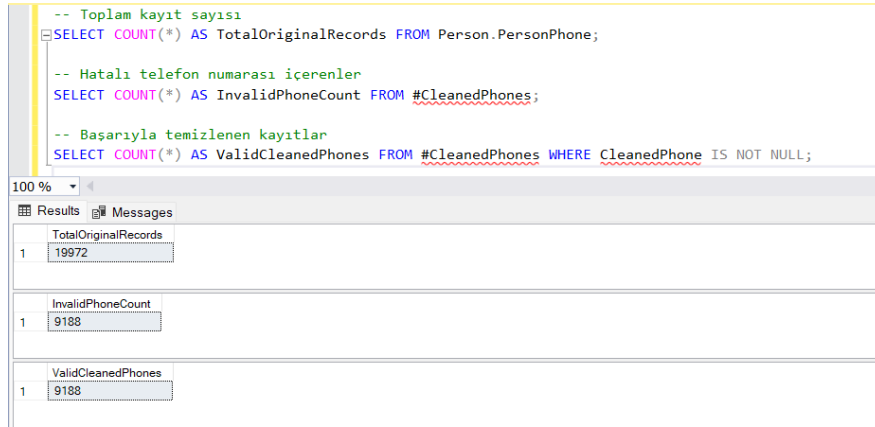
	BusinessEntityID	CleanedPhone
1	1959	500-555-0110
2	2409	500-555-0110
3	2467	500-555-0110
4	2488	500-555-0110
5	2510	500-555-0110
6	2553	500-555-0110
7	2621	500-555-0110
8	2625	500-555-0110
9	3637	500-555-0110
10	3843	500-555-0110
11	3884	500-555-0110
12	4341	500-555-0110
13	4348	500-555-0110
14	4511	500-555-0110
15	4651	500-555-0110
16	4772	500-555-0110
17	4871	500-555-0110
18	4920	500-555-0110
19	4973	500-555-0110
20	5239	500-555-0110
21	5303	500-555-0110
22	5454	500-555-0110
23	5851	500-555-0110
24	6089	500-555-0110
25	6117	500-555-0110
26	6134	500-555-0110
27	6182	500-555-0110
28	6404	500-555-0110
29	6542	500-555-0110
30	6544	500-555-0110
31	6802	500-555-0110
32	6896	500-555-0110
33	6897	500-555-0110
34	7070	500-555-0110

Adım 7: Veri Kalitesi Raporu

```
-- Toplam kayıt sayısı
SELECT COUNT(*) AS TotalOriginalRecords FROM Person.PersonPhone;

-- Hatalı telefon numarası içerenler
SELECT COUNT(*) AS InvalidPhoneCount FROM #CleanedPhones;

-- Başarıyla temizlenen kayıtlar
SELECT COUNT(*) AS ValidCleanedPhones FROM #CleanedPhones WHERE CleanedPhone IS NOT NULL;
```



TotalOriginalRecords: 19972

Person.PersonPhone tablosundaki toplam kayıt sayısı

InvalidPhoneCount: 9188

Geçici tabloya alınan ve üzerinde işlem yapılan telefon kayıtları (örneğin sadece belirli pattern'e sahip olanlar)

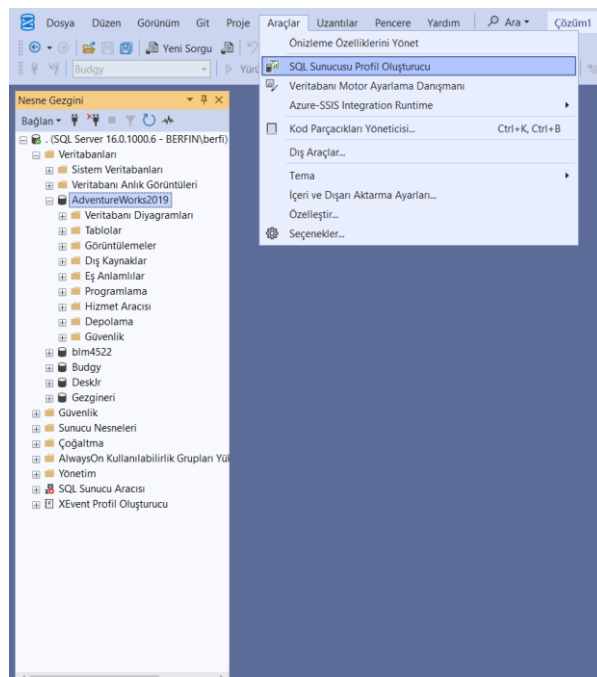
ValidCleanedPhones: 9188

Başarıyla temizlenen ve CleanedPhone alanına yazılan kayıt sayısı

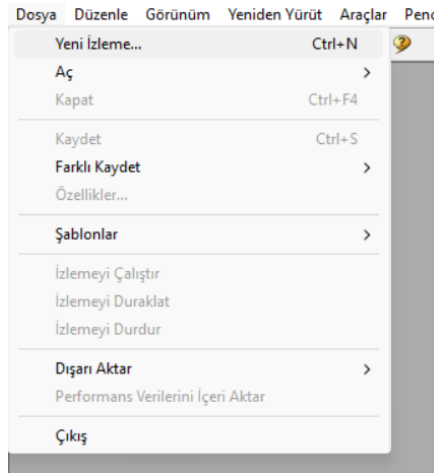
PROJE 1: VERİTABANI PERFORMANS OPTİMİZASYONU VE İZLEME

Adım 1: SQL Server Profiler ile Sorgu İzleme

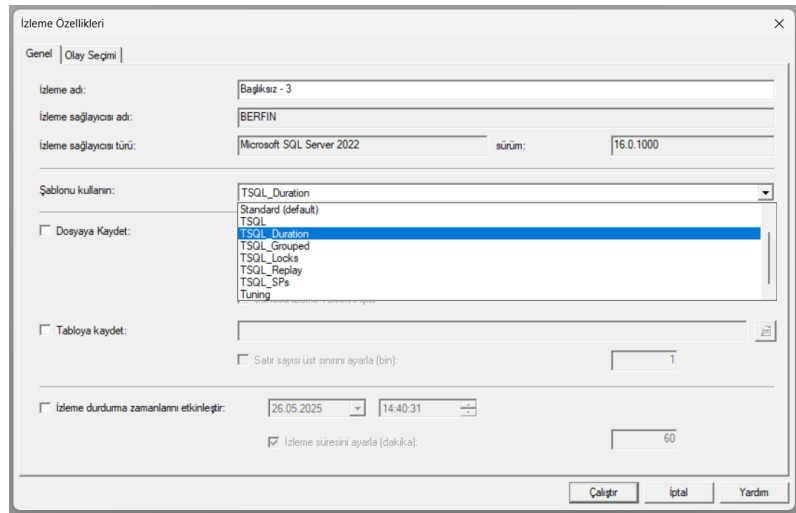
- SSMS → Tools → SQL Server Profiler'ı açalım.



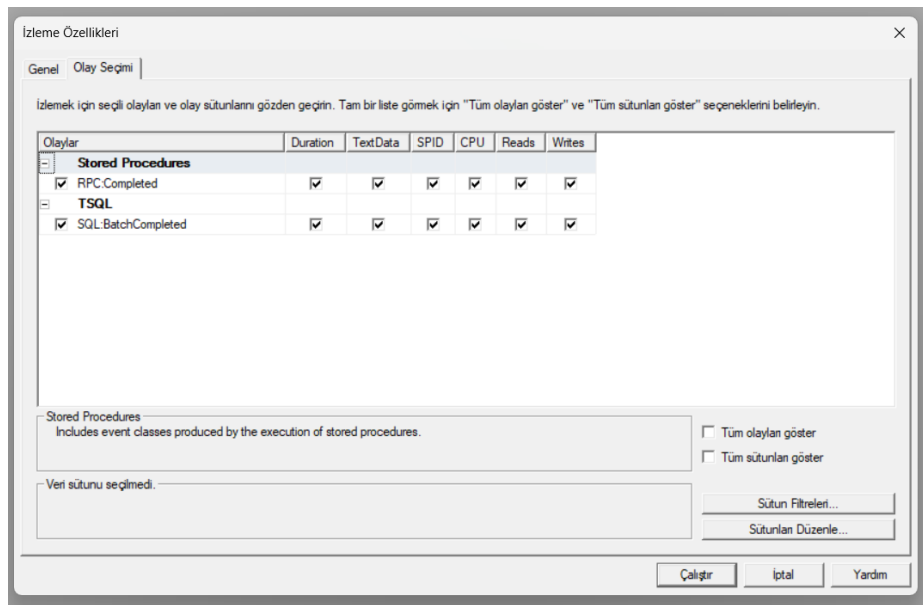
- New Trace → AdventureWorks2019 veritabanını seçelim.



- "TSQL_Duration" gibi bir template seçelim.



- Duration, Reads, Writes sütunlarını filtreleyelim.



- Kayıtı başlatılır.

EventClass	Duration	TextData	SPID	CPU	Reads	Writes
Trace start						
İzleme çalışıyor.						
Ln 1, Col 1 Sırtlar: 1						

- Birkaç sorgu çalıştırılır.

Query2.sql - berfi (69) *

ProductID	Name	ProductNumber	MakeFlag	FinishedGoodsFlag	Color	SafetyStockLevel	ReorderPoint	StandardCost	ListPrice	Size	SizeUnitMeasureCode	WeightUnitMeasureCode	Weight	DaysToManufacture	ProductLine
1	706 HL Road Frame - Red 58	FR-R02R-58	1	1	Red	500	375	1099.31	1431.50	58	CM	LB	2.24	1	R
2	707 Sport-100 Helmet, Red	HL-U00R-R	0	1	Red	4	3	13.0863	34.99	NULL	NULL	NULL	0	1	S
3	717 HL Road Frame - Red 62	FR-R02R-62	1	1	Red	500	375	868.6342	1431.50	62	CM	LB	2.30	1	R
4	718 HL Road Frame - Red 44	FR-R02R-44	1	1	Red	500	375	868.6342	1431.50	44	CM	LB	2.12	1	R
5	719 HL Road Frame - Red 48	FR-R02R-48	1	1	Red	500	375	868.6342	1431.50	48	CM	LB	2.16	1	R
6	720 HL Road Frame - Red 52	FR-R02R-52	1	1	Red	500	375	868.6342	1431.50	52	CM	LB	2.20	1	R
7	721 HL Road Frame - Red 56	FR-R02R-56	1	1	Red	500	375	868.6342	1431.50	56	CM	LB	2.24	1	R
8	725 LL Road Frame - Red 44	FR-R03R-44	1	1	Red	500	375	187.1571	337.22	44	CM	LB	2.32	1	R
9	726 LL Road Frame - Red 48	FR-R03R-48	1	1	Red	500	375	187.1571	337.22	48	CM	LB	2.36	1	R
10	727 LL Road Frame - Red 52	FR-R03R-52	1	1	Red	500	375	187.1571	337.22	52	CM	LB	2.40	1	R
11	728 LL Road Frame - Red 58	FR-R03R-58	1	1	Red	500	375	187.1571	337.22	58	CM	LB	2.46	1	R
12	729 LL Road Frame - Red 60	FR-R03R-60	1	1	Red	500	375	187.1571	337.22	60	CM	LB	2.48	1	R
13	730 LL Road Frame - Red 62	FR-R03R-62	1	1	Red	500	375	187.1571	337.22	62	CM	LB	2.50	1	R
14	731 ML Road Frame - Red 44	FR-R72R-44	1	1	Red	500	375	352.1394	594.83	44	CM	LB	2.22	1	R
15	732 ML Road Frame - Red 48	FR-R72R-48	1	1	Red	500	375	352.1394	594.83	48	CM	LB	2.26	1	R
16	733 ML Road Frame - Red 52	FR-R72R-52	1	1	Red	500	375	352.1394	594.83	52	CM	LB	2.30	1	R
17	734 ML Road Frame - Red 58	FR-R72R-58	1	1	Red	500	375	352.1394	594.83	58	CM	LB	2.36	1	R
18	735 ML Road Frame - Red 60	FR-R72R-60	1	1	Red	500	375	352.1394	594.83	60	CM	LB	2.38	1	R
19	749 Road-150 Red 62	BK-R03R-62	1	1	Red	100	75	2171.2942	3578.27	62	CM	LB	15.00	4	R
20	750 Road-150 Red 44	BK-R03R-44	1	1	Red	100	75	2171.2942	3578.27	44	CM	LB	13.77	4	R
21	751 Road-150 Red 48	BK-R03R-48	1	1	Red	100	75	2171.2942	3578.27	48	CM	LB	14.13	4	R
22	752 Road-150 Red 52	BK-R03R-52	1	1	Red	100	75	2171.2942	3578.27	52	CM	LB	14.42	4	R
23	753 Road-150 Red 56	BK-R03R-56	1	1	Red	100	75	2171.2942	3578.27	56	CM	LB	14.68	4	R
24	754 Road-450 Red 58	BK-R08R-58	1	1	Red	100	75	884.7083	1457.99	58	CM	LB	17.79	4	R
25	755 Road-450 Red 60	BK-R08R-60	1	1	Red	100	75	884.7083	1457.99	60	CM	LB	17.90	4	R
26	756 Road-450 Red 44	BK-R08R-44	1	1	Red	100	75	884.7083	1457.99	44	CM	LB	16.77	4	R
27	757 Road-450 Red 48	BK-R08R-48	1	1	Red	100	75	884.7083	1457.99	48	CM	LB	17.13	4	R

SQLQuery2.sql...berfi (69))

```

1 SELECT *
2 FROM Sales.SalesOrderDetail
3 WHERE ProductID IN (
4     SELECT ProductID
5     FROM Production.Product
6     WHERE ListPrice > 1000
7 );
8

```

100 % Sorun bulunamadı Sat: 8 Krkt: 1 BŞL CRLF

SalesOrderID	SalesOrderDetailID	CarrierTrackingNumber	OrderQty	ProductID	SpecialOfferID	UnitPrice	UnitPriceDiscount	LineTotal	rowguid	ModifiedDate
43659	1	4911-403C-98	1	776	1	2024.994	0.00	2024.994000	B207C96D-D9E6-402B-8470-2CC176C42283	2011-05-31 00:00:00.000
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
43659	3	4911-403C-98	1	778	1	2024.994	0.00	2024.994000	479CF806-49F6-489E-80AD-AFC6A50CDD2F	2011-05-31 00:00:00.000
43659	4	4911-403C-98	1	771	1	2039.994	0.00	2039.994000	04C4CE31-5815-4806-8670-F462719FBCE3	2011-05-31 00:00:00.000
43659	5	4911-403C-98	1	772	1	2039.994	0.00	2039.994000	8474C7D2-E641-439E-47AC-37BF23280301	2011-05-31 00:00:00.000
43659	6	4911-403C-98	2	773	1	2039.994	0.00	4079.988000	CE472532-A4C0-45BA-516E-EFDF3FD84583	2011-05-31 00:00:00.000
43659	7	4911-403C-98	1	774	1	2039.994	0.00	2039.994000	8066784D-F962-4EE3-96E0-AECA108E0D4F	2011-05-31 00:00:00.000
43660	14	6431-4D57-83	1	758	1	874.794	0.00	874.794000	500B2803-1D4C-4C34-9696-C14C58E7301C	2011-05-31 00:00:00.000
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
43661	16	4E0A-4F89-AE	1	743	1	714.7043	0.00	714.704300	FE10BF09-D477-485B-9541-27AE053A6D4	2011-05-31 00:00:00.000
43661	17	4E0A-4F89-AE	2	747	1	714.7043	0.00	1429.408600	B136852E-24C9-4006-8048-B14AEF6C337	2011-05-31 00:00:00.000
43661	20	4E0A-4F89-AE	2	742	1	722.5949	0.00	1445.189800	05A9D3B-A178-4656-B2B0-989BDDF1C345	2011-05-31 00:00:00.000
43661	21	4E0A-4F89-AE	3	775	1	2024.994	0.00	6074.982000	8C342A15-9576-4581-AAC9-7BA3B8B8FDB8	2011-05-31 00:00:00.000
43661	22	4E0A-4F89-AE	2	778	1	2024.994	0.00	4049.988000	B2760B75-3F1A-4DC4-A377-1051C03C9E88	2011-05-31 00:00:00.000
43661	24	4E0A-4F89-AE	2	741	1	818.70	0.00	1637.400000	2F911593-E389-440F-8757-72A2004FF88E	2011-05-31 00:00:00.000
43661	25	4E0A-4F89-AE	4	776	1	2024.994	0.00	8099.978000	E9E15860-3A73-4507-9368-A4FB2786EE0B	2011-05-31 00:00:00.000
43661	26	4E0A-4F89-AE	2	773	1	2039.994	0.00	4079.988000	4373070F-4E6F-4C50-90B0-96BF8E937383	2011-05-31 00:00:00.000
43661	28	4E0A-4F89-AE	2	777	1	2024.994	0.00	4049.988000	C5762004-DE9E-4339-96E5-89CC8FF873E	2011-05-31 00:00:00.000
43662	33	2E53-4802-85	4	754	1	874.794	0.00	3499.176000	DF2A7F2-37F2-4016-BEDF-4DBB8C888631	2011-05-31 00:00:00.000
43662	38	2E53-4802-85	1	753	1	2146.962	0.00	2146.962000	491C561F-8B1E-47D0-95D5-6519654A5F47	2011-05-31 00:00:00.000
43662	39	2E53-4802-85	1	756	1	874.794	0.00	874.794000	2BA4CC58-B832-47C0-AEFA-D150D29CC083	2011-05-31 00:00:00.000
43662	42	2E53-4802-85	6	758	1	874.794	0.00	5248.764000	2C4F704D-C794-4613-9C88-258619FA20FA	2011-05-31 00:00:00.000
43662	45	2E53-4802-85	1	749	1	2146.962	0.00	2146.962000	0F38E442-912C-4EB4-8506-27ABF861E2E2	2011-05-31 00:00:00.000
43662	51	2E53-4802-85	1	755	1	874.794	0.00	874.794000	7AC1F435-53EE-4D53-4532-42D7A3A610E5	2011-05-31 00:00:00.000
43664	53	2F44-4BA1-B8	1	772	1	2039.994	0.00	2039.994000	22CB5F49-8C64-4806-B038-435E6F0D07E42	2011-05-31 00:00:00.000
43664	54	2F44-4BA1-B8	4	775	1	2024.994	0.00	8099.978000	70E95644-A664-42E3-948D-F677765D1DA0	2011-05-31 00:00:00.000
43664	57	2F44-4BA1-B8	2	777	1	2024.994	0.00	4049.988000	525344A5-1293-4379-8C59-F38421FAADB8	2011-05-31 00:00:00.000

SQLQuery2.sql...berfi (69))

```

1 SELECT TOP 100 *
2 FROM Production.Product
3 WHERE Name LIKE '%Mountain%'
4 ORDER BY ListPrice DESC;
5

```

100 % Sorun bulunamadı Sat: 5 Krkt: 1 SEKMELER CRLF

ProductID	Name	ProductNumber	MakeFlag	FinishedGoodsFlag	Color	SafetyStockLevel	ReorderPoint	StandardCost	ListPrice	Size	SizeUnitMeasureCode	WeightUnitMeasureCode	Weight	DaysToManufacture	ProductLine
774	Mountain-100 Silver, 48	BK-M825-48	1	1	Silver	100	75	1912.1544	3399.99	48	CM	LB	21.42	4	M
773	Mountain-100 Silver, 44	BK-M825-44	1	1	Silver	100	75	1912.1544	3399.99	44	CM	LB	21.13	4	M
772	Mountain-100 Silver, 42	BK-M825-42	1	1	Silver	100	75	1912.1544	3399.99	42	CM	LB	20.77	4	M
771	Mountain-100 Silver, 38	BK-M825-38	1	1	Silver	100	75	1912.1544	3399.99	38	CM	LB	20.35	4	M
778	Mountain-100 Black, 48	BK-M828-48	1	1	Black	100	75	1898.0944	3374.99	48	CM	LB	21.42	4	M
777	Mountain-100 Black, 44	BK-M828-44	1	1	Black	100	75	1898.0944	3374.99	44	CM	LB	21.13	4	M
776	Mountain-100 Black, 42	BK-M828-42	1	1	Black	100	75	1898.0944	3374.99	42	CM	LB	20.77	4	M
775	Mountain-100 Black, 38	BK-M828-38	1	1	Black	100	75	1898.0944	3374.99	38	CM	LB	20.35	4	M
781	Mountain-200 Silver, 46	BK-M685-46	1	1	Silver	100	75	1265.6195	2319.99	46	CM	LB	24.13	4	M
780	Mountain-200 Silver, 42	BK-M685-42	1	1	Silver	100	75	1265.6195	2319.99	42	CM	LB	23.77	4	M
779	Mountain-200 Silver, 38	BK-M685-38	1	1	Silver	100	75	1265.6195	2319.99	38	CM	LB	23.35	4	M
784	Mountain-200 Black, 46	BK-M688-46	1	1	Black	100	75	1251.9813	2294.99	46	CM	LB	24.13	4	M
783	Mountain-200 Black, 42	BK-M688-42	1	1	Black	100	75	1251.9813	2294.99	42	CM	LB	23.77	4	M
782	Mountain-200 Black, 38	BK-M688-38	1	1	Black	100	75	1251.9813	2294.99	38	CM	LB	23.35	4	M
742	HL Mountain Frame - Silver, 46	FR-M945-46	1	1	Silver	500	375	747.2002	1364.50	46	CM	LB	2.84	1	M
741	HL Mountain Frame - Silver, 48	FR-M945-52	1	1	Silver	500	375	706.811	1364.50	48	CM	LB	2.80	1	M
740	HL Mountain Frame - Silver, 44	FR-M945-44	1	1	Silver	500	375	706.811	1364.50	44	CM	LB	2.76	1	M
739	HL Mountain Frame - Silver, 42	FR-M945-42	1	1	Silver	500	375	747.2002	1364.50	42	CM	LB	2.72	1	M
748	HL Mountain Frame - Silver, 38	FR-M945-38	1	1	Silver	500	375	747.2002	1364.50	38	CM	LB	2.68	2	M
747	HL Mountain Frame - Black, 38	FR-M948-38	1	1	Black	500	375	739.041	1349.60	38	CM	LB	2.68	2	M
746	HL Mountain Frame - Black, 46	FR-M948-46	1	1	Black	500	375	739.041	1349.60	46	CM	LB	2.84	1	M
745	HL Mountain Frame - Black, 48	FR-M948-48	1	1	Black	500	375	699.0928	1349.60	48	CM	LB	2.80	1	M
744	HL Mountain Frame - Black, 44	FR-M948-44	1	1	Black	500	375	699.0928	1349.60	44	CM	LB	2.76	1	M
743	HL Mountain Frame - Black, 42	FR-M948-42	1	1	Black	500	375	739.041	1349.60	42	CM	LB	2.72	1	M
788	Mountain-300 Black, 48	BK-M478-48	1	1	Black	100	75	598.4354	1079.99	48	CM	LB	26.42	4	M
787	Mountain-300 Black, 44	BK-M478-44	1	1	Black	100	75	598.4354	1079.99	44	CM	LB	26.13	4	M

Sorgu başarıyla yürütüldü. (local) (16.0 RTM) BERFIN\berfi (69) AdventureWorks2019 00:00:00 94 satır

Adım 2: DMV ile Aktif Sorguları Görüntüleme

- Sorgu 1: Şu An Çalışan Sorguları Göster

SQLQuery2.sql...berfi (69))

```

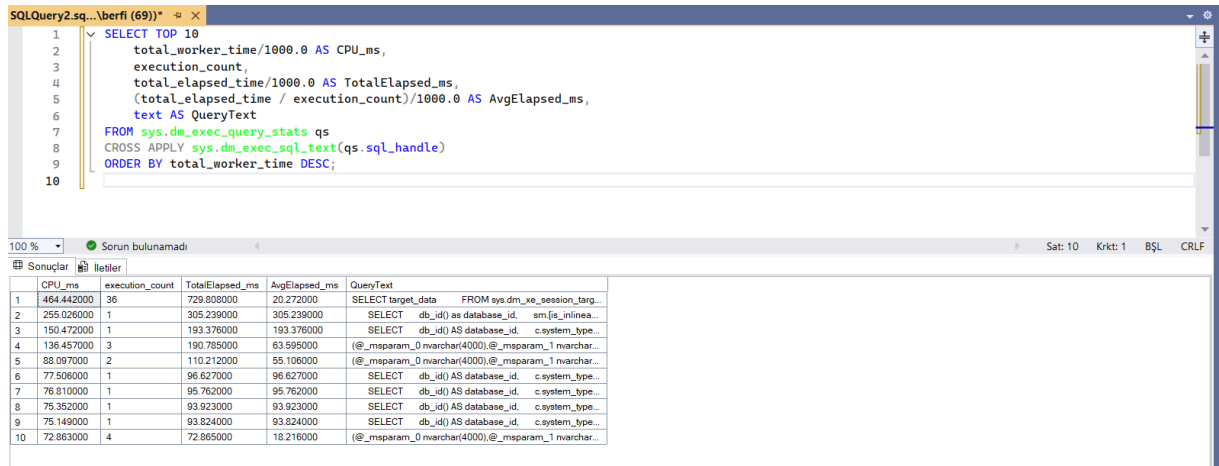
1 SELECT
2     r.session_id,
3     r.status,
4     r.start_time,
5     r.cpu_time,
6     r.total_elapsed_time,
7     r.logical_reads,
8     t.text AS executing_sql
9 FROM sys.dm_exec_requests r
10 CROSS APPLY sys.dm_exec_sql_text(r.sql_handle) t
11 WHERE r.database_id = DB_ID('AdventureWorks2019');
12

```

100 % Sorun bulunamadı Sat: 12 Krkt: 1 BŞL CRLF

session_id	status	start_time	cpu_time	total_elapsed_time	logical_reads	executing_sql
69	running	2025-05-26 13:52:05.080	1	1	25	SELECT r.session_id, r.status, r...

- Sorgu 2: CPU Tüketimi En Yüksek Sorgular



SQLQuery2.sql...berfi (69))

```
1 SELECT TOP 10
2     total_worker_time/1000.0 AS CPU_ms,
3     execution_count,
4     total_elapsed_time/1000.0 AS TotalElapsed_ms,
5     (total_elapsed_time / execution_count)/1000.0 AS AvgElapsed_ms,
6     text AS QueryText
7 FROM sys.dm_exec_query_stats qs
8 CROSS APPLY sys.dm_exec_sql_text(qs.sql_handle)
9 ORDER BY total_worker_time DESC;
10
```

100 % Sorun bulunamadı Sat: 10 Krkt: 1 BSL CRLF

	CPU_ms	execution_count	TotalElapsed_ms	AvgElapsed_ms	QueryText
1	464.442000	36	729.808000	20.272000	SELECT target_data FROM sys.dm_xe_session_targ...
2	255.026000	1	305.239000	305.239000	SELECT db_id() as database_id, sm.js_inlinea...
3	150.472000	1	193.376000	193.376000	SELECT db_id() AS database_id, c.system_type...
4	136.457000	3	190.785000	63.595000	(@_msparam_0 nvarchar(4000)),@_msparam_1 nvarchar...
5	88.097000	2	110.212000	55.106000	(@_msparam_0 nvarchar(4000)),@_msparam_1 nvarchar...
6	77.506000	1	96.627000	96.627000	SELECT db_id() AS database_id, c.system_type...
7	76.810000	1	95.762000	95.762000	SELECT db_id() AS database_id, c.system_type...
8	75.352000	1	93.923000	93.923000	SELECT db_id() AS database_id, c.system_type...
9	75.149000	1	93.824000	93.824000	SELECT db_id() AS database_id, c.system_type...
10	72.863000	4	72.865000	18.216000	(@_msparam_0 nvarchar(4000)),@_msparam_1 nvarchar...

- Sorgu 3: En Fazla IO (Disk Okuma/Yazma) Tüketen Sorgular



SQLQuery2.sql...berfi (69))

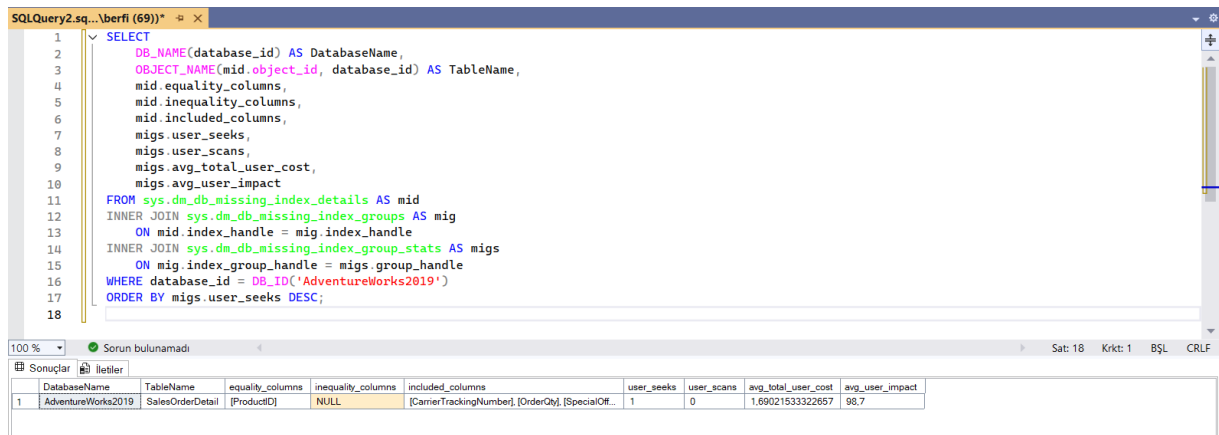
```
1 SELECT TOP 10
2     total_logical_reads AS Reads,
3     total_logical_writes AS Writes,
4     execution_count,
5     text AS QueryText
6 FROM sys.dm_exec_query_stats qs
7 CROSS APPLY sys.dm_exec_sql_text(qs.sql_handle)
8 ORDER BY total_logical_reads DESC;
9
```

100 % Sorun bulunamadı Sat: 9 Krkt: 1 BSL CRLF

	Reads	Writes	execution_count	QueryText
1	243636	0	3	(@_msparam_0 nvarchar(4000)),@_msparam_1 nvarchar(40...
2	182277	0	1	SELECT db_id() as database_id, sm.js_inlineable...
3	162447	0	2	(@_msparam_0 nvarchar(4000)),@_msparam_1 nvarchar(40...
4	81367	0	1	(@_msparam_0 nvarchar(4000)),@_msparam_1 nvarchar(40...
5	13207	0	1	select category_id, '1' category_name, '2' type, ...
6	12675	138	3	(@_msparam_0 nvarchar(4000))SELECT SCHEMA_NAME(u...
7	10788	0	1	SELECT db_id() AS database_id, c.system_type_id...
8	8378	89	2	(@_msparam_0 nvarchar(4000))SELECT SCHEMA_NAME(u...
9	8296	3	1	SELECT db_id() AS database_id, o.[type] AS object...
10	7710	0	1	SELECT DB_ID() AS database_id, is_remote_data_ar...

Adım 3: İndeks Kullanımı Analizi

- Sorgu 1: Eksik İndeksleri Tespit Et (Missing Indexes)



SQLQuery2.sql...berfi (69))

```
1 SELECT
2     DB_NAME(database_id) AS DatabaseName,
3     OBJECT_NAME(mid.object_id, database_id) AS TableName,
4     mid.equality_columns,
5     mid.inequality_columns,
6     mid.included_columns,
7     migs.user_seeks,
8     migs.avg_total_user_cost,
9     migs.avg_user_impact
10 FROM sys.dm_db_missing_index_details AS mid
11 INNER JOIN sys.dm_db_missing_index_groups AS mig
12     ON mid.index_handle = mig.index_handle
13 INNER JOIN sys.dm_db_missing_index_group_stats AS migs
14     ON mig.index_group_handle = migs.group_handle
15 WHERE database_id = DB_ID('AdventureWorks2019')
16 ORDER BY migs.user_seeks DESC;
17
18
```

100 % Sorun bulunamadı Sat: 18 Krkt: 1 BSL CRLF

	DatabaseName	TableName	equality_columns	inequality_columns	included_columns	user_seeks	user_scans	avg_total_user_cost	avg_user_impact
1	AdventureWorks2019	SalesOrderDetail	[ProductID]	NULL	[CarrierTrackingNumber], [OrderQty], [SpecialOff...	1	0	1.69021533322657	98.7

- Sorgu 2: Kullanılmayan / Gereksiz İndeksler

SQLQuery2.sql...berfi (69)*

```

1 SELECT
2     OBJECT_NAME(i.object_id) AS TableName,
3     i.name AS IndexName,
4     i.index_id,
5     dm.user_seeks,
6     dm.user_scans,
7     dm.user_lookups,
8     dm.user_updates,
9 FROM sys.indexes i
10 LEFT JOIN sys.dm_db_index_usage_stats dm
11     ON i.object_id = dm.object_id AND i.index_id = dm.index_id
12     AND dm.database_id = DB_ID('AdventureWorks2019')
13 WHERE OBJECTPROPERTY(i.object_id, 'IsUserTable') = 1
14 AND i.name IS NOT NULL
15 ORDER BY dm.user_updates DESC;
16

```

100 % Sorun bulunamadı Sat: 16 Krkt: 1 BŞL CRLF

TableName	IndexName	index_id	user_seeks	user_scans	user_lookups	user_updates
Product	PK_Product_ProductID	1	0	3	0	0
SalesOrderDetail	PK_SalesOrderDetail_SalesOrderDetailID	1	0	1	0	0
sysdiagrams	UK_principal_name	2	0	5	0	0
Person	PK_Person_BusinessEntityID	1	0	1	0	0
Person	IX_Person_LastName_FirstName_MiddleName	2	NULL	NULL	NULL	NULL
Person	AK_Person_rowguid	3	NULL	NULL	NULL	NULL
Person	PXML_Person_AddContact	256000	NULL	NULL	NULL	NULL
Person	PXML_Person_Demographics	256001	NULL	NULL	NULL	NULL
Person	XMLPATH_Person_Demographics	256002	NULL	NULL	NULL	NULL
Person	XMLPROPERTY_Person_Demographics	256003	NULL	NULL	NULL	NULL
Person	XMLVALUE_Person_Demographics	256004	NULL	NULL	NULL	NULL
SalesReason	PK_SalesReason_SalesReasonID	1	NULL	NULL	NULL	NULL
JobCandidate	PK_JobCandidate_JobCandidateID	1	NULL	NULL	NULL	NULL
JobCandidate	IX_JobCandidate_BusinessEntityID	2	NULL	NULL	NULL	NULL
Location	PK_Location_LocationID	1	NULL	NULL	NULL	NULL
Location	AK_Location_Name	2	NULL	NULL	NULL	NULL
Password	PK_Password_BusinessEntityID	1	NULL	NULL	NULL	NULL
SalesPersonQuotaHistory	PK_SalesPersonQuotaHistory_BusinessEntityID_Quota	1	NULL	NULL	NULL	NULL
SalesPersonQuotaHistory	AK_SalesPersonQuotaHistory_rowguid	2	NULL	NULL	NULL	NULL

Sorgu başarıyla yürütüldü. (local) (16.0 RTM) BERFIN\berfi (69) AdventureWorks2019 00:00:00 177 satır

Adım 4: Sorgu İyileştirme (Query Optimization)

- Aynı sorgunun kötü ve iyi versiyonlarını çalıştıracğız.
 - Execution Plan (Yürütme Planı) ile analiz edeceğiz.
 - Hangi indekslerin ve yazım şeklinin sorguyu nasıl etkilediğini göreceğiz.
- Hazırlık: Execution Plan'ı aktif edelim.

Sorgu Git Proje Araçlar Uzantılar Pencere Yardım Ara Çöz

Bağlantı

- Sunucuyu Nesne Gezgininde Aç Alt+F8
- Şablon Parametreleri için değerleri belirtin... Ctrl+Shift+M
- Yürüt Alt+X
- Sorgu Yürütmeyi İptal Et Alt+Break
- Ayrıştır Ctrl+F5
- Tahmini Yürütme Planını Görüntüle Ctrl+L
- IntelliSense Etkin Ctrl+B, Ctrl+I
- SQL Server Profiler'da İzleme Sorgusu Ctrl+Alt+P
- Sorguyu Veritabanı Altyapısı Ayarlama Danışmanı'nda Analiz Et
- Düzenleyicide Sorgu Tasarla... Ctrl+Shift+Q
- Gerçek Yürütme Planını Ekle Ctrl+M
- Canlı Sorgu İstatistiklerini Ekle
- İstemci İstatistiklerini Dahil Et Shift+Alt+S
- Müşteri İstatistiklerini Sıfırla
- SQLCMD Modu
- Sonuçları Şuraya Aktar:
- Sorgu Seçenekleri...

• Sorgu Örneği: Kötü Optimizasyon

SQLQuery4.sql...berfi (69))

```
1 SELECT *
2 FROM Sales.SalesOrderDetail
3 WHERE ProductID = 776;
4
```

100 % Sorun bulunamadı Sat: 4 Krkt: 1 SEKMELER CRLF

	SalesOrderID	SalesOrderDetailID	CarrierTrackingNumber	OrderQty	ProductID	SpecialOfferID	UnitPrice	UnitPriceDiscount	LineTotal	rowguid	ModifiedDate
1	43659	1	4911-403C-98	1	776	1	2024.994	0.00	2024.994000	B207C96D-D9E6-402B-8470-2CC176C42283	2011-05-31 00:00:00.000
2	43661	25	4E0A-4F89-AE	4	776	1	2024.994	0.00	8099.976000	E8E15B60-3A73-4507-9368-A4FB2786EE08	2011-05-31 00:00:00.000
3	43665	70	19F0-4639-8E	1	776	1	2024.994	0.00	2024.994000	0D2A679C-6C8E-4CC2-8A55-B8DB83937AC2	2011-05-31 00:00:00.000
4	43670	114	F101-4649-85	1	776	1	2024.994	0.00	2024.994000	7E07B269-8004-418E-4A26-A3883526E467	2011-05-31 00:00:00.000
5	43672	127	F4B5-48D0-BA	2	776	1	2024.994	0.00	4049.988000	4FC9F9C7-3629-41D0-8BAC-E022B0D068A93	2011-05-31 00:00:00.000
6	43676	150	11BA-AD19-B7	2	776	1	2024.994	0.00	4049.988000	95F26303-015E-4965-BA70-08755928F169	2011-05-31 00:00:00.000
7	43683	230	2299-44F7-98	2	776	1	2024.994	0.00	4049.988000	02170C53-A0B1-407A-A4E9-B1B56990CB01	2011-05-31 00:00:00.000
8	43694	333	EC3D-48E0-A6	3	776	1	2024.994	0.00	6074.982000	E35B03A3-1A70-4151-A854-75167E12FDC2	2011-05-31 00:00:00.000
9	43831	487	NULL	1	776	1	3374.99	0.00	3374.990000	75917978-DC30-4DFD-A6F4-F60A1066D67D	2011-06-28 00:00:00.000
10	43843	508	AEB6-4356-80	3	776	1	2024.994	0.00	6074.982000	442DD51F-7B31-4216-96FD-5E7D13E25BCD	2011-07-01 00:00:00.000
11	43844	510	15C3-40C5-AC	2	776	1	2024.994	0.00	4049.988000	5267D3D2-56A4-4CF4-96CB-1773B40DE9DD	2011-07-01 00:00:00.000
12	43848	533	FB94-4C38-B1	4	776	1	2024.994	0.00	8099.976000	D56BC1DF-8A5C-4136-A843-E99EB70D72C1	2011-07-01 00:00:00.000
13	43849	535	D0B8-4476-BA	2	776	1	2024.994	0.00	4049.988000	7F9765DD-3214-4248-8020-9EEA304A18FD	2011-07-01 00:00:00.000
14	43852	569	C745-45C2-A1	1	776	1	2024.994	0.00	2024.994000	2E82577E-B090-4B98-B241-2F58D9E19F3D	2011-07-01 00:00:00.000
15	43853	573	434D-4DA4-96	4	776	1	2024.994	0.00	8099.976000	48A0B88B-0365-490D-81DB-477FD8AC2B5A	2011-07-01 00:00:00.000
16	43864	679	B5D8-4803-96	4	776	1	2024.994	0.00	8099.976000	79E2275C-BD3D-424B-9F66-33D29B4620F6	2011-07-01 00:00:00.000
17	43867	703	061F-4449-BE	2	776	1	2024.994	0.00	4049.988000	9549D477-E94D-4280-9775-9088F065F072	2011-07-01 00:00:00.000
18	43875	807	CE1F-4E31-89	8	776	1	2024.994	0.00	16199.952000	B1D4C540-8513-42C0-B8E5-DCFA0F812096	2011-07-01 00:00:00.000
19	43881	874	89D3-4830-8F	2	776	1	2024.994	0.00	4049.988000	6D2460DE-D448-40A3-94E6-A6C01B8806DA	2011-07-01 00:00:00.000
20	43884	905	728A-44AB-A8	5	776	1	2024.994	0.00	10124.970000	38E7EB62-A5AC-4384-9C6A-D70EE674337F	2011-07-01 00:00:00.000
21	43890	968	6787-4174-98	2	776	1	2024.994	0.00	4049.988000	ABD3089E-25F7-4D18-AC69-E43F83A78CB9	2011-07-01 00:00:00.000
22	43891	981	1094-43CB-B1	2	776	1	2024.994	0.00	4049.988000	6841EC15-0B39-4073-8E29-6501CB14AF67	2011-07-01 00:00:00.000
23	43894	1001	7DF2-4E54-B0	4	776	1	2024.994	0.00	8099.976000	60FC628F-89ED-441C-BE27-1B34038FC888	2011-07-01 00:00:00.000
24	43895	1017	5233-4CB8-B0	4	776	1	2024.994	0.00	8099.976000	11B86B44-5F68-4513-B574-4D19B12781BE	2011-07-01 00:00:00.000
25	43897	1034	128F-4FD9-A4	5	776	1	2024.994	0.00	10124.970000	A778E551-396D-4F2A-A610-CB49FA425ED4	2011-07-01 00:00:00.000
26	43900	1063	1593-48BA-96	2	776	1	2024.994	0.00	4049.988000	8C8AD5E3-82ED-4762-8C8B-5F15F2959B20	2011-07-01 00:00:00.000
27	43901	1093	5FDB-4B79-97	1	776	1	2024.994	0.00	2024.994000	26EB8228-58CB-4470-A480-7ACD2F895404	2011-07-01 00:00:00.000
28	43902	1108	E3ED-4AB5-B2	2	776	1	2024.994	0.00	4049.988000	BD3D05CC-4A47-4450-B112-8BC18F84B536	2011-07-01 00:00:00.000
29	43906	1153	8A78-4228-89	3	776	1	2024.994	0.00	6074.982000	F6399A11-D058-4837-8FA0-2ACC271A8240	2011-07-01 00:00:00.000
30	43909	1183	9467-4A37-A4	3	776	1	2024.994	0.00	6074.982000	AD73AB47-94D8-4375-ED28-0BF71ED3516F	2011-07-01 00:00:00.000

SQLQuery4.sql...berfi (69))

```
1 SELECT *
2 FROM Sales.SalesOrderDetail
3 WHERE ProductID = 776;
4
```

100 % Sorun bulunamadı Sat: 4 Krkt: 1 SEKMELER CRLF

1 sorgusu: Sorgu maliyeti (toplu işe göre): %100
SELECT * FROM (Sales).(SalesOrderDetail) WHERE (ProductID)=@1

Skaler Hesapla (Skaler İşlem) Maliyet: %0
İç İçe Döngüler (İç Birleştirme) Maliyet: %0
Dizin Arama (NonClustered) [SalesOrderDetail].[IX_Sales... Maliyet: %1
Anahtar Arama (Clustered) [SalesOrderDetail].[PK_Sales... Maliyet: %99
Skaler Hesapla (Skaler İşlem) Maliyet: %0

Başlıksız - 3 (BERFIN)

EventClass	Duration	TextData	SPID	CPU	Reads	Writes
SQL:BatchCompleted	0	SELECT u.name AS [Name], u.principal...	77	0	54	0
SQL:BatchCompleted	0	DECLARE @edition sysname; SET @edit...	69	0	0	0
SQL:BatchCompleted	0	DECLARE @edition sysname; SET @edit...	67	0	0	0
SQL:BatchCompleted	0	DECLARE @edition sysname; SET @edit...	69	0	0	0
SQL:BatchCompleted	0	SELECT SCHEMA_NAME(tt.schema_id) AS ...	77	0	7	0
SQL:BatchCompleted	0	GRANT SELECT, INSERT, UPDATE ON Sa...	67	0	4	0
SQL:BatchCompleted	0	DECLARE @edition sysname; SET @edit...	51	0	0	0
SQL:BatchCompleted	0	DECLARE @edition sysname; SET @edit...	85	0	0	0
SQL:BatchCompleted	0	SELECT TOP 5 * FROM Sales.SalesOrder...	69	0	6	0
SQL:BatchCompleted	0	SELECT SERVERPROPERTY('EngineEdi...	83	0	0	0
SQL:BatchCompleted	0	GRANT SELECT, INSERT, UPDATE ON dbo...	69	0	4	0
SQL:BatchCompleted	0	GRANT SELECT, INSERT, UPDATE ON db...	67	0	4	0
SQL:BatchCompleted	0	SELECT r.l.name AS [Name] FROM sys.da...	77	0	60	0
SQL:BatchCompleted	0	SELECT dp.name AS DatabaseRole...	69	0	18	0
SQL:BatchCompleted	0	use [Adventureworks2019]	74	0	0	0
SQL:BatchCompleted	0	DECLARE @edition sysname; SET @edit...	51	0	0	0
SQL:BatchCompleted	0	SELECT dtb.name AS [Name], CAST(0 AS...	77	0	56	0
SQL:BatchCompleted	0	GRANT SELECT, INSERT, UPDATE ON db...	69	0	4	0
SQL:BatchCompleted	0	SELECT dtb.name AS [Name], CAST(0 AS...	83	0	74	0
SQL:BatchCompleted	0	GRANT SELECT, INSERT, UPDATE ON dbo...	69	0	4	0
SQL:BatchCompleted	0	DECLARE @edition sysname; SET @edit...	69	0	0	0

```
SELECT *
FROM Sales.SalesOrderDetail
WHERE ProductID IN
(
SELECT ProductID
FROM Production.Product
WHERE ListPrice > 1000
);
```

İzleme çalışıyor. Ln 1125, Col 3 Satırlar: 1126

- İyileştirilmiş Versiyon: İndeks ve Hedefli Sütunlarla

SQLQuery4.sq... \berfi (69))*

```

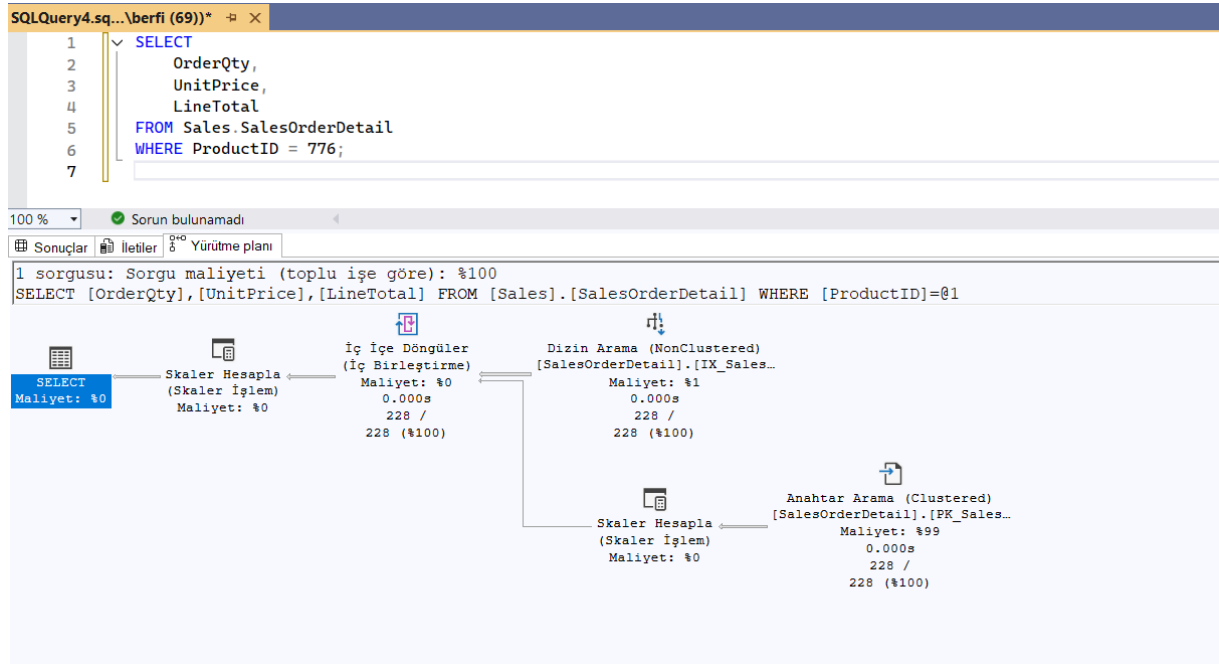
1 SELECT
2   OrderQty,
3   UnitPrice,
4   LineTotal
5 FROM Sales.SalesOrderDetail
6 WHERE ProductID = 776;
7

```

100 % Sorun bulunamadı

	Sonuçlar	İletiler	Yürütme planı
	OrderQty	UnitPrice	LineTotal
1	1	2024.994	2024.994000
2	4	2024.994	8099.976000
3	1	2024.994	2024.994000
4	1	2024.994	2024.994000
5	2	2024.994	4049.988000
6	2	2024.994	4049.988000
7	2	2024.994	4049.988000
8	3	2024.994	6074.982000
9	1	3374.99	3374.990000
10	3	2024.994	6074.982000
11	2	2024.994	4049.988000
12	4	2024.994	8099.976000
13	2	2024.994	4049.988000
14	1	2024.994	2024.994000
15	4	2024.994	8099.976000
16	4	2024.994	8099.976000
17	2	2024.994	4049.988000
18	8	2024.994	16199.952000
19	2	2024.994	4049.988000
20	5	2024.994	10124.970000
21	2	2024.994	4049.988000
22	2	2024.994	4049.988000
23	4	2024.994	8099.976000
24	4	2024.994	8099.976000
25	5	2024.994	10124.970000
26	2	2024.994	4049.988000
27	1	2024.994	2024.994000
28	2	2024.994	4049.988000

Sorun başarıyla yürütüldü.



- Sürelerine bakarak karşılaştırma yapabiliriz. Bu farkı Execution Plan ve sorgu çalışma süresi üzerinden görebiliriz.

SQLQuery4.sq...berfi (69))*

```

1 SET STATISTICS TIME ON;
2 SELECT *
3 FROM Sales.SalesOrderDetail
4 WHERE ProductID = 776;
5 SET STATISTICS TIME OFF;
6

```

100 % Sorun bulunamadı

Sonuçlar İletiler Yürütme planı

SQL Server parse and compile time:
CPU time = 0 ms, elapsed time = 0 ms.

(228 satır etkilendi)

(1 satır etkilendi)

SQL Server Execution Times:
CPU time = 0 ms, elapsed time = 79 ms.

Tamamlanma süresi:2025-05-26T14:15:54.3889811+03:00

SQLQuery4.sq...berfi (69))*

```

1 SET STATISTICS TIME ON;
2 SELECT
3     OrderQty,
4     UnitPrice,
5     LineTotal
6 FROM Sales.SalesOrderDetail
7 WHERE ProductID = 776;
8 SET STATISTICS TIME ON;
9

```

100 % 1 0

Sonuçlar İletiler Yürütme planı

SQL Server parse and compile time:
CPU time = 0 ms, elapsed time = 0 ms.

(228 satır etkilendi)

(1 satır etkilendi)

SQL Server Execution Times:
CPU time = 0 ms, elapsed time = 46 ms.

SQL Server Execution Times:
CPU time = 0 ms, elapsed time = 0 ms.

SQL Server parse and compile time:
CPU time = 0 ms, elapsed time = 0 ms.

SQL Server Execution Times:
CPU time = 0 ms, elapsed time = 0 ms.

Tamamlanma süresi:2025-05-26T14:17:40.4912906+03:00

Adım 5: İndeks Yönetimi ve Gereksiz İndekslerin Kaldırılması

1. İndekslerin Listelenmesi ve Kullanım Analizi

Aşağıdaki sorgu ile AdventureWorks2019 üzerindeki indekslerin durumunu ve kullanım sayılarını görebiliriz:

SQLQuery4.sq...berfi (69))*

```

1 SELECT
2     OBJECT_NAME(i.object_id) AS TableName,
3     i.name AS IndexName,
4     i.type_desc,
5     user_seeks,
6     user_scans,
7     user_lookups,
8     user_updates
9 FROM
10    sys.indexes i
11 LEFT JOIN
12    sys.dm_db_index_usage_stats s
13 ON i.object_id = s.object_id AND i.index_id = s.index_id
14 WHERE
15    OBJECTPROPERTY(i.object_id, 'IsUserTable') = 1
16 ORDER BY
17    user_seeks DESC, user_scans DESC;
18

```

100 % 1 0

Sonuçlar İletiler Yürütme planı

TableName	IndexName	type_desc	user_seeks	user_scans	user_lookups	user_updates
SalesOrderDetail	IX_SalesOrderDetail_ProductID	NONCLUSTERED	11	0	0	0
sysdiagrams	UK_principal_name	NONCLUSTERED	0	5	0	0
Product	PK_Product_ProductID	CLUSTERED	0	3	0	0
Person	PK_Person_BusinessEntityID	CLUSTERED	0	1	0	0
SalesOrderDetail	PK_SalesOrderDetail_SalesOrderID_SalesOrderDetailID	CLUSTERED	0	1	11	0
SalesOrderDetail	AK_SalesOrderDetail_rowguid	NONCLUSTERED	NULL	NULL	NULL	NULL
Person	IX_Person_LastName_FirstName_MiddleName	NONCLUSTERED	NULL	NULL	NULL	NULL
Person	AK_Person_rowguid	NONCLUSTERED	NULL	NULL	NULL	NULL
Person	PXML_Person_AddContact	XML	NULL	NULL	NULL	NULL
Person	PXML_Person_Demographics	XML	NULL	NULL	NULL	NULL
Person	PXMLPATH_Person_Demographics	XML	NULL	NULL	NULL	NULL
Person	XMLPROPERTY_Person_Demographics	XML	NULL	NULL	NULL	NULL
Person	XMLVALUE_Person_Demographics	XML	NULL	NULL	NULL	NULL
SalesReason	PK_SalesReason_SalesReasonID	CLUSTERED	NULL	NULL	NULL	NULL
JobCandidate	PK_JobCandidate_JobCandidateID	CLUSTERED	NULL	NULL	NULL	NULL
JobCandidate	IX_JobCandidate_BusinessEntityID	NONCLUSTERED	NULL	NULL	NULL	NULL
Location	PK_Location_LocationID	CLUSTERED	NULL	NULL	NULL	NULL
Location	AK_Location_Name	NONCLUSTERED	NULL	NULL	NULL	NULL

✓ Sorgu başarıyla yürütüldü.

(local) (16.0 RTM) BERFIN\berfi (69) AdventureWorks2019 00:00:00 182 satır

- user_seeks: İndekse doğrudan erişim (arama)
- user_scans: İndeksin tüm taranması
- user_lookups: Key Lookup (taleplerin tamamlanması için tabloya başvurma)
- user_updates: İndeks güncellemeleri (ekleme, silme, güncelleme)

```
SQLQuery4.sql...berfi (69))"
1 SELECT * FROM sys.database_principals WHERE type = 'R';
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```

- Kullanıcının mevcut rollerini görelim.

```
SQLQuery4.sql... \berfi (69))*  X
1  SELECT
2      dp.name AS DatabaseRoleName,
3      mp.name AS MemberName
4  FROM
5      sys.database_role_members drm
6  JOIN
7      sys.database_principals dp ON drm.role_principal_id = dp.principal_id
8  JOIN
9      sys.database_principals mp ON drm.member_principal_id = mp.principal_id
10 WHERE
11     mp.name = 'testuser2';
12
```

100 % 1 0

Sonuçlar İletiler

	DatabaseRoleName	MemberName
1	db_owner	testuser2
2	db_datareader	testuser2
3	db_datawriter	testuser2

- Özel rol oluşturalım.

```
SQLQuery4.sql... \berfi (69))*  X
1  CREATE ROLE custom_data_manager;
2
```

100 % 1 0

İletiler

SQL Server parse and compile time:
CPU time = 0 ms, elapsed time = 0 ms.

Tamamlanma süresi:2025-05-26T15:08:35.7761037+03:00

- Rolü kullanıcıya atayalım.

```
SQLQuery4.sql... \berfi (69))*  X
1  ALTER ROLE custom_data_manager ADD MEMBER testuser2;
2
```

100 % 1 0

İletiler

SQL Server parse and compile time:
CPU time = 0 ms, elapsed time = 0 ms.

Tamamlanma süresi:2025-05-26T15:15:17.7972519+03:00

- Rolü kullanarak izin verelim.

```
SQLQuery4.sq...berfi (69))*
1 GRANT SELECT ON Sales.SalesOrderHeader TO custom_data_manager;
2 GRANT SELECT ON Sales.Customer TO custom_data_manager;
3
```

100 % 1 0

İletiler

SQL Server parse and compile time:
CPU time = 0 ms, elapsed time = 0 ms.

Tamamlanma süresi:2025-05-26T15:15:46.6552923+03:00

- Şimdi testuser2 kullanıcı adıyla veritabanına bağlanıp sadece izin verdiğimiz tabloları okuyabiliyor mu test edebiliriz.

```
SQLQuery8.sq...tuser2 (85))*
1 SELECT TOP 5 * FROM Sales.SalesOrderHeader; -- izin verilen tablo, çalışmalı
2 SELECT TOP 5 * FROM Person.Person; -- izin verilmedi, hata vermeli
3
```

100 % Sorun bulunamadı

Sat: 3 Krkt: 1 SEKMELER CRLF

SalesOrderID	RevisionNumber	OrderDate	DueDate	ShipDate	Status	OnlineOrderFlag	SalesOrderNumber	PurchaseOrderNumber	AccountNumber	CustomerID	SalesPersonID	TerritoryID	BillToAddressID
43659	8	2011-05-31 00:00:00.000	2011-06-12 00:00:00.000	2011-06-07 00:00:00.000	5	0	SO43659	PO522145787	10-4020-000676	29825	279	5	985
43660	8	2011-05-31 00:00:00.000	2011-06-12 00:00:00.000	2011-06-07 00:00:00.000	5	0	SO43660	PO18850127500	10-4020-000117	29672	279	5	921
43661	8	2011-05-31 00:00:00.000	2011-06-12 00:00:00.000	2011-06-07 00:00:00.000	5	0	SO43661	PO18473189620	10-4020-000442	29734	282	6	517
43662	8	2011-05-31 00:00:00.000	2011-06-12 00:00:00.000	2011-06-07 00:00:00.000	5	0	SO43662	PO18444174044	10-4020-000227	29994	282	6	482
43663	8	2011-05-31 00:00:00.000	2011-06-12 00:00:00.000	2011-06-07 00:00:00.000	5	0	SO43663	PO18009186470	10-4020-000510	29565	276	4	1073

BusinessEntityID	PersonType	NameStyle	Title	FirstName	MiddleName	LastName	Suffix	EmailPromotion	AdditionalContactInfo	Demographics	rowguid	ModifiedDate
1	EM	0	NULL	Ken	J	Sánchez	NULL	0	NULL	<IndividualSurvey xmlns="http://schemas.microsoft.com/SQLServer/ReportModel/IndividualSurvey">http://schemas.microsoft.com/SQLServer/ReportModel/IndividualSurvey</IndividualSurvey>	9204279F-1207-48A3-8448-4636514E87E2	2009-01-07 00:00:00.000
2	EM	0	NULL	Terri	Lee	Duffy	NULL	1	NULL	<IndividualSurvey xmlns="http://schemas.microsoft.com/SQLServer/ReportModel/IndividualSurvey">http://schemas.microsoft.com/SQLServer/ReportModel/IndividualSurvey</IndividualSurvey>	D8763459-9AA9-47CC-AFF7-C9079AF79033	2008-01-24 00:00:00.000
3	EM	0	NULL	Roberto	NULL	Tamburello	NULL	0	NULL	<IndividualSurvey xmlns="http://schemas.microsoft.com/SQLServer/ReportModel/IndividualSurvey">http://schemas.microsoft.com/SQLServer/ReportModel/IndividualSurvey</IndividualSurvey>	E1A2955E-0828-434B-A33B-6F38136A37DE	2007-11-04 00:00:00.000
4	EM	0	NULL	Rob	NULL	Walters	NULL	0	NULL	<IndividualSurvey xmlns="http://schemas.microsoft.com/SQLServer/ReportModel/IndividualSurvey">http://schemas.microsoft.com/SQLServer/ReportModel/IndividualSurvey</IndividualSurvey>	F2D7CE06-38B3-4357-905B-F486B71C01FF	2007-11-28 00:00:00.000
5	EM	0	Ms	Gail	A	Erickson	NULL	0	NULL	<IndividualSurvey xmlns="http://schemas.microsoft.com/SQLServer/ReportModel/IndividualSurvey">http://schemas.microsoft.com/SQLServer/ReportModel/IndividualSurvey</IndividualSurvey>	F3A3F6B4-AE3B-430C-A754-9F2231BA8FEF	2007-12-30 00:00:00.000

Proje 2: Veritabanı Yedekleme ve Felaketten Kurtarma Planı

Adım 1: Tam, Artık ve Fark yedeklemelerini alalım (Proje 7 için yapmıştık).

Adım 2: Zamanlamalarını ayarlayalım (Proje 7 için yapmıştık).

Adım 3: Felaketten Kurtarma Senaryoları

- Kaza ile Silinen Verilerin Geri Getirilmesi (Point-in-Time Restore)

```
SQLQuery10.sq...berfi (96))*
1 -- Önce tam yedeği geri yükle (NORECOVERY ile)
2 RESTORE DATABASE AdventureWorks2019_Restore
3 FROM DISK = 'C:\Program Files\Microsoft SQL Server\MSSQL16.MSSQLSERVER\MSSQL\Backup\AdventureWorks2019_FULL.bak'
4 WITH NORECOVERY, MOVE 'AdventureWorks2019' TO 'C:\SqlBackups\AdventureWorks2019_Restore.mdf',
5 MOVE 'AdventureWorks2019_Log' TO 'C:\SqlBackups\AdventureWorks2019_Restore.ldf';
6
```

100 % Sorun bulunamadı

İletiler

Processed 26568 pages for database 'AdventureWorks2019_Restore', file 'AdventureWorks2019' on file 1.
Processed 2 pages for database 'AdventureWorks2019_Restore', file 'AdventureWorks2019_Log' on file 1.
RESTORE DATABASE successfully processed 26570 pages in 0.218 seconds (916.338 MB/sec).

Tamamlanma süresi:2025-05-26T17:33:36.1672006+03:00

```
SQLQuery10.s...\berfi (96))*  
1 -- Ardından fark yedeği (varsa)  
2 RESTORE DATABASE AdventureWorks2019_Restore  
3 FROM DISK = 'C:\SqlBackup\AdventureWorks2019_Diff.bak'  
4 WITH NORECOVERY;  
  
100 %  
Sorum bulunamadi  
iletler  
ilet 3201, Duzey 16, Durum 2, Satir 2  
Cannot open backup device 'C:\SqlBackup\AdventureWorks2019_Diff.bak'. Operating system error 3(Sistem belirtilen yolu bulamiyor.).  
ilet 3013, Duzey 16, Durum 1, Satir 2  
RESTORE DATABASE is terminating abnormally.  
Tamamlanma süresi:2025-05-26T17:34:37.1206691+03:00
```

- Geri yükleme işlemini tamamla

```
SQLQuery10.s...\berfi (96))*  
1 RESTORE DATABASE AdventureWorks2019_Restore WITH RECOVERY;  
2  
  
100 %  
1 0  
iletler  
RESTORE DATABASE successfully processed 0 pages in 0.130 seconds (0.000 MB/sec).  
Tamamlanma süresi:2025-05-26T17:37:49.9892122+03:00
```

Adım 4: Test Yedekleme Senaryosu

- Bir sorgu ile test edelim.

```
SQLQuery10.s...\berfi (96))*  
1 USE AdventureWorks2019_Restore;  
2 SQLQuery10.sql - (local).AdventureWorks2019_Restore (BERFIN\berfi (96))*  
3  
4 SELECT TOP 10 * FROM Person Person;  
5  
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1 0  
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BusinessEntityID PersonType NameStyle Title FirstName MiddleName LastName Suffix EmailPromotion AdditionalContactInfo Demographics rowguid ModifiedDate  
1 1 EM 0 NULL Ken J Sánchez NULL 0 NULL <IndividualSurvey xmlns="http://schemas.microsoft.com/SQL/Analytics/PersonSurvey" rowguid="92C4279F-1207-48A3-8448-4636514EB7E2" modifieddate="2009-01-07 00:00:00.000" />  
2 2 EM 0 NULL Terri Lee Duffy NULL 1 NULL <IndividualSurvey xmlns="http://schemas.microsoft.com/SQL/Analytics/PersonSurvey" rowguid="D8763459-9AA8-47CC-AFF7-C9079AF79033" modifieddate="2009-01-24 00:00:00.000" />  
3 3 EM 0 NULL Roberto NULL Tamburello NULL 0 NULL <IndividualSurvey xmlns="http://schemas.microsoft.com/SQL/Analytics/PersonSurvey" rowguid="E1A2555E-0B28-434B-A33B-6F38136A37DE" modifieddate="2007-11-04 00:00:00.000" />  
4 4 EM 0 NULL Rob NULL Walters NULL 0 NULL <IndividualSurvey xmlns="http://schemas.microsoft.com/SQL/Analytics/PersonSurvey" rowguid="F2D7CE06-38B3-4357-905B-F486871C01FF" modifieddate="2007-11-28 00:00:00.000" />  
5 5 EM 0 Ms Gail A Erickson NULL 0 NULL <IndividualSurvey xmlns="http://schemas.microsoft.com/SQL/Analytics/PersonSurvey" rowguid="F3A3F6B4-AE3B-430C-A754-9F2231BA6FEF" modifieddate="2007-12-30 00:00:00.000" />  
6 6 EM 0 Mr. Josef H. Goldberg NULL 0 NULL <IndividualSurvey xmlns="http://schemas.microsoft.com/SQL/Analytics/PersonSurvey" rowguid="D0EA28FD-EFFE-482A-AFD3-87E8F199D56F" modifieddate="2013-12-16 00:00:00.000" />  
7 7 EM 0 NULL Dylan A Miller NULL 2 NULL <IndividualSurvey xmlns="http://schemas.microsoft.com/SQL/Analytics/PersonSurvey" rowguid="C45E8AB8-01BE-4B76-B215-820C8368181A" modifieddate="2009-02-01 00:00:00.000" />  
8 8 EM 0 NULL Diane L Margheim NULL 0 NULL <IndividualSurvey xmlns="http://schemas.microsoft.com/SQL/Analytics/PersonSurvey" rowguid="A948E590-4A66-45A9-BC9A-160A1CC9D990" modifieddate="2008-12-22 00:00:00.000" />  
9 9 EM 0 NULL Gigi N Mathew NULL 0 NULL <IndividualSurvey xmlns="http://schemas.microsoft.com/SQL/Analytics/PersonSurvey" rowguid="5FC28C0E-6D36-4252-9846-05CAA0B1F6C5" modifieddate="2009-01-09 00:00:00.000" />  
10 10 EM 0 NULL Michael NULL Raheem NULL 2 NULL <IndividualSurvey xmlns="http://schemas.microsoft.com/SQL/Analytics/PersonSurvey" rowguid="CA2C740E-75B2-420C-9D4B-E3CB6609604" modifieddate="2009-04-26 00:00:00.000" />
```

- Satır sayılarını kontrol edelim.

SQLQuery11.s... \berfi (63))*

```

1  -- Restore edilen veritabanında
2  USE AdventureWorks2019_Restore;
3  SELECT COUNT(*) AS [PersonCount] FROM Person.Person;
4  SELECT COUNT(*) AS [SalesOrderCount] FROM Sales.SalesOrderHeader;
5
6  -- Orijinal veritabanında
7  USE AdventureWorks2019;
8  SELECT COUNT(*) AS [PersonCount] FROM Person.Person;
9  SELECT COUNT(*) AS [SalesOrderCount] FROM Sales.SalesOrderHeader;
10

```

100 % Sorun bulunamadı

Sonuçlar İletiler

	PersonCount
1	19972

	SalesOrderCount
1	31465

	PersonCount
1	19972

	SalesOrderCount
1	31465

Proje 6: Veritabanı Yükseltme ve Sürüm Yönetimi

Adım 1: Veritabanı Yükseltme Planı Hazırlama

- Şu anki veritabanı uyumluluk seviyesini kontrol edelim.

SQLQuery1.sql - (lo...(BERFIN\berfi (63))*

```

SELECT name, compatibility_level
FROM sys.databases
WHERE name = 'AdventureWorks2019';

```

100 %

Results Messages

	name	compatibility_level
1	AdventureWorks2019	150

110 = SQL Server 2012

130 = SQL Server 2016

150 = SQL Server 2019

160 = SQL Server 2022

- Uyumlu hale getirme (yükseltme planı)

```
SQLQuery1.sql - (lo...(BERFIN\berfi (63))* X
ALTER DATABASE AdventureWorks2019
SET COMPATIBILITY_LEVEL = 160;

100 %
Messages
Commands completed successfully.

Completion time: 2025-05-27T14:03:44.4647878+03:00
```

Adım 2: Sürüm Yönetimi - Şema Değişikliklerini İzleme (DDL Trigger)

- DDL değişikliklerini loglayacağımız tabloyu oluşturalım.

```
SQLQuery1.sql - (lo...(BERFIN\berfi (63))* X
CREATE TABLE SchemaChangeLog (
    EventTime DATETIME,
    LoginName NVARCHAR(100),
    UserName NVARCHAR(100),
    EventType NVARCHAR(100),
    ObjectName NVARCHAR(100),
    CommandText NVARCHAR(MAX)
);

100 %
Messages
Commands completed successfully.

Completion time: 2025-05-27T14:04:34.8816382+03:00
```

- DDL trigger oluşturalım.

```
SQLQuery1.sql - (lo...(BERFIN\berfi (63))* X
CREATE TRIGGER trg_SchemaChangeLog
ON DATABASE
FOR DDL_DATABASE_LEVEL_EVENTS
AS
BEGIN
    INSERT INTO SchemaChangeLog (EventTime, LoginName, UserName, EventType, ObjectName, CommandText)
    SELECT
        GETDATE(),
        SYSTEM_USER,
        USER_NAME(),
        EVENTDATA().value('/EVENT_INSTANCE/EventType)[1]', 'NVARCHAR(100)',
        EVENTDATA().value('/EVENT_INSTANCE/ObjectName)[1]', 'NVARCHAR(100)',
        EVENTDATA().value('/EVENT_INSTANCE/TSQLCommand/CommandText)[1]', 'NVARCHAR(MAX)';
END;

100 %
Messages
Commands completed successfully.

Completion time: 2025-05-27T14:05:15.9386239+03:00
```

- Bir test değişikliği yapalım ve log tablosunu kontrol edelim.

```
SQLQuery1.sql - (lo...(BERFIN\berfi (63))*)
CREATE TABLE TestDDLChange (
    ID INT
);
SELECT * FROM SchemaChangeLog;
```

100 %

Results Messages

EventTime	LoginName	UserName	EventType	ObjectName	CommandText
2025-05-27 14:05:55.007	BERFIN\berfi	dbo	CREATE_TABLE	TestDDLChange	CREATE TABLE TestDDLChange (ID INT)

Adım 3: Test ve Geri Dönüş Planı

- Veritabanını yedekleyelim. (Tam Yedekleme)

```
SQLQuery1.sql - (lo...(BERFIN\berfi (63))*)
BACKUP DATABASE AdventureWorks2019
TO DISK = 'C:\SqlBackups\AdventureWorks2019_PreUpgrade.bak'
WITH FORMAT, INIT,
NAME = 'AdventureWorks2019 Tam Yedek - Yükseltme Öncesi';
```

100 %

Messages

Processed 25568 pages for database 'AdventureWorks2019', file 'AdventureWorks2019' on file 1.
Processed 2 pages for database 'AdventureWorks2019', file 'AdventureWorks2019_log' on file 1.
BACKUP DATABASE successfully processed 25570 pages in 0.439 seconds (455.038 MB/sec).

Completion time: 2025-05-27T14:09:21.4414257+03:00

- Yedeklemenin başarılı olduğunu doğrulayalım.

```
SQLQuery1.sql - (lo...(BERFIN\berfi (63))*)
RESTORE FILELISTONLY
FROM DISK = 'C:\SqlBackups\AdventureWorks2019_PreUpgrade.bak';
```

100 %

Results Messages

LogicalName	PhysicalName	Type	FileGroupName	Size	MaxSize	Field	CreateLSN	DropLSN	Uniqued	ReadOnlyLSN	ReadW
AdventureWorks2019	C:\Program Files\Microsoft SQL Server\MSSQL16.MSS...	D	PRIMARY	276824064	35184372080640	1	0	0	FBAD6D5F-27F1-4D28-8483-E2149ACD7C13	0	0
AdventureWorks2019_log	C:\Program Files\Microsoft SQL Server\MSSQL16.MSS...	L	NULL	75497472	2199023255552	2	0	0	3DF51AFC-02E6-4D8E-8E84-CE6101F2EE28	0	0

- Test geri yüklemesi (Ayrı bir isimle)

```
SQLQuery1.sql - (lo...(BERFIN\berfi (63))*)
RESTORE DATABASE AdventureWorks2019_TestRestore
FROM DISK = 'C:\SqlBackups\AdventureWorks2019_PreUpgrade.bak'
WITH MOVE 'AdventureWorks2019' TO 'C:\SqlBackups\AdventureWorks2019_TestRestore.mdf',
MOVE 'AdventureWorks2019_log' TO 'C:\SqlBackups\AdventureWorks2019_TestRestore.ldf',
RECOVERY;
```

100 %

Messages

Processed 25568 pages for database 'AdventureWorks2019_TestRestore', file 'AdventureWorks2019' on file 1.
Processed 2 pages for database 'AdventureWorks2019_TestRestore', file 'AdventureWorks2019_log' on file 1.
RESTORE DATABASE successfully processed 25570 pages in 0.178 seconds (1122.256 MB/sec).

Completion time: 2025-05-27T14:10:37.8684723+03:00

- Geri dönüş planı (Gerekirse)

```
SQLQuery1.sql - (lo...(BERFIN\berfi (63))*) X
USE master;
ALTER DATABASE AdventureWorks2019 SET SINGLE_USER WITH ROLLBACK IMMEDIATE;

RESTORE DATABASE AdventureWorks2019
FROM DISK = 'C:\SqlBackups\AdventureWorks2019_PreUpgrade.bak'
WITH REPLACE;
```

100 %

Messages

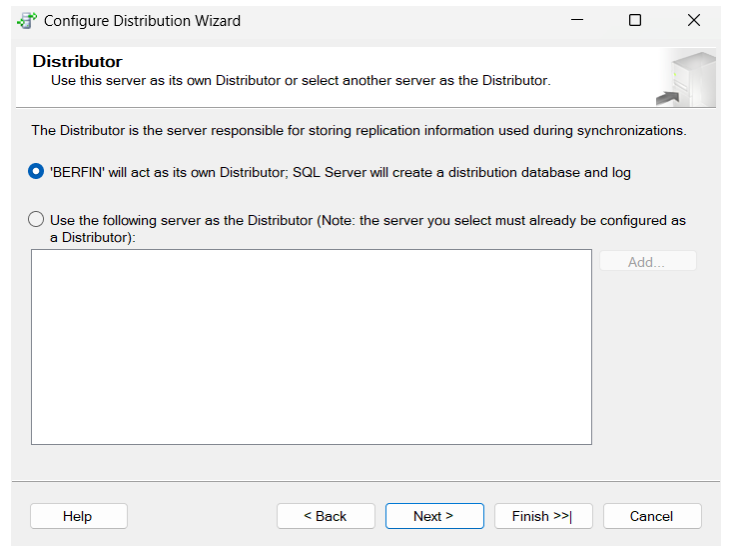
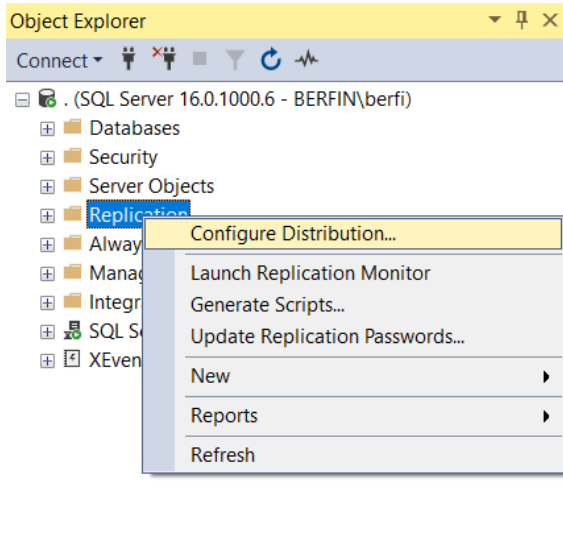
Processed 25568 pages for database 'AdventureWorks2019', file 'AdventureWorks2019' on file 1.
Processed 2 pages for database 'AdventureWorks2019', file 'AdventureWorks2019_log' on file 1.
RESTORE DATABASE successfully processed 25570 pages in 0.182 seconds (1097.591 MB/sec).

Completion time: 2025-05-27T14:11:25.8717772+03:00

Proje 4: Veritabanı Yük Dengeleme ve Dağıtık Veritabanı Yapıları

Adım 1: Veritabanı Replikasyonu (Replication)

- SQL Server Agent'ı başlatalım.
- Publisher, Distributor ve Subscriber rollerini tanıyalım.
 - Publisher: Veriyi dağıtan sunucu/veritabanı (AdventureWorks2019)
 - Distributor: Veriyi yöneten ve ileten rol (genelde aynı sunucu olur)
 - Subscriber: Veriyi alan diğer sunucu/veritabanı
- Replikasyon kurulumu
 - Dağıtıcı (Distributor) Yapılandırması




Configure Distribution Wizard

Snapshot Folder

Specify the root location where snapshots will be stored.

To allow Distribution and Merge Agents that run at Subscribers to access the snapshots of their publications, you must use a network path to refer to the snapshot folder.

Snapshot folder:
C:\Program Files\Microsoft SQL Server\MSSQL16.MSSQLSERVER\MSSQL\RepData

 This snapshot folder does not support pull subscriptions created at the Subscriber. It is not a network path or it is a drive letter mapped to a network path. To support both push and pull subscriptions, use a network path to refer to this folder.

Help < Back Next > Finish >> Cancel

Configure Distribution Wizard

Distribution Database

Select the name and location of the distribution database and log files.

The distribution database stores changes to transactional publications until Subscribers can be updated. It also stores historical information for snapshot and merge publications.

Distribution database name:
distribution

Folder for the distribution database file:
C:\Program Files\Microsoft SQL Server\MSSQL16.MSSQLSERVER\MSSQL\Data

Folder for the distribution database log file:
C:\Program Files\Microsoft SQL Server\MSSQL16.MSSQLSERVER\MSSQL\Data

The paths must refer to disks that are local to the Distributor and begin with a local drive letter and colon (for example, C:). Mapped drive letters and network paths are invalid.

Help < Back Next > Finish >> Cancel

Configure Distribution Wizard

Complete the Wizard

Verify the choices made in the wizard and click Finish.

Click Finish to perform the following actions:

- Configure distribution.

Distribution will be configured with the following options:

- Use 'BERFIN' as the Distributor.
- Configure the SQL Server Agent service on 'BERFIN' to start automatically when the computer is started.
- Use 'C:\Program Files\Microsoft SQL Server\MSSQL16.MSSQLSERVER\MSSQL\RepData' as the root snapshot folder for Publishers using this Distributor.
- Store the distribution database 'distribution' in 'C:\Program Files\Microsoft SQL Server\MSSQL16.MSSQLSERVER\MSSQL\Data'.
- Store the distribution database log file in 'C:\Program Files\Microsoft SQL Server\MSSQL16.MSSQLSERVER\MSSQL\Data'.
- Allow the following servers running SQL Server to use BERFIN as their Distributor:
 - BERFIN

Help < Back Next > Finish Cancel

Completes the wizard

Bu aşamadan sonrasında bir türlü çözemediğim çok fazla hata alıyorum. Distrubition oluşturamadığım için projeye devam edemiyorum.