SQL Server 2016
New Features for Developers

INTRODUCTION AND OVERVIEW

Leonard Lobel
CTO, SLEEK TECHNOLOGIES

@lennilobel

SQL Server Versions 2008 – 2016 (Developer Features)

2008

- Table -valued parameters (TVPs)
- New date and time types
- MERGE
- INSERT OVER DML
- GROUPING SETS
- hierarchyid
- FILESTREAM
- Geospatial
- Transparent Data Encryption (TDE)
- Change Data Capture (CDC)
- SQL Audit

2012

- SQL Server Data Tools (SSDT)
- Windowing (OVER) Enhancements
- 14 new general-purpose functions
- 8 new analytic windowing functions
- Server-side paging
- Sequences
- Metadata Discovery
- FileTable
- Columnstore indexes

2016

- DROP IF EXISTS (DIE)
- SESSION_CONTEXT
- Dynamic data masking (DDM)
- Row-level security (RLS)
- Always encrypted
- Stretch database
- Temporal
- JSON
- Query Store
- PolyBase
- R integration

2008 R2

- BI Refresh

2014

- Hekaton

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Exploring SQL Server Tools and Language Enhancements

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Exploring SQL Server Tools and Language Enhancements

SQL Server 2012-2014 Native File Streaming

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Overview of New SQL Server 2016 Developer Features

DIE
- Drop If Exists

SESSION_CONTEXT()
- Stateful dictionary

Dynamic data masking
- Mask sensitive columns

Row-level security
- Filter/block row-level access

Always encrypted
- Client-side encryption

Stretch database
- Hybrid cloud feature

Temporal data
- Point-in-time data access

Built-in JSON support
- Store/retrieve/transform JSON

What's not covered in this course
- Query Store
  - Capture and cache execution plans
- PolyBase
  - Non-relational Hadoop integration
- R integration
  - Advanced analytics with R

SSMS vs. SSDT

SQL Server Management Studio (SSMS)

- Object Explorer
- Query window (F5)

SQL Server Data Tools (SSDT)

- Database tooling integrated in Visual Studio
- SQL Server Object Explorer
- Query window (CTRL+SHIFT+E)
- Source control, database projects, integrated debugger, and more

Exploring SQL Server Tools and Language Enhancements

Take your pick

- SSMS or SSDT, it's your choice
- We'll be using SSMS throughout this course

Just DIE (Drop If Exists) Please!

If you hate this…

```
- IF OBJECT_ID('dbo.Product', 'U') IS NOT NULL
   DROP TABLE dbo.Product
- IF EXISTS (SELECT * FROM sys.triggers
   WHERE name = 'trProductInsert')
    DROP TRIGGER trProductInsert
```

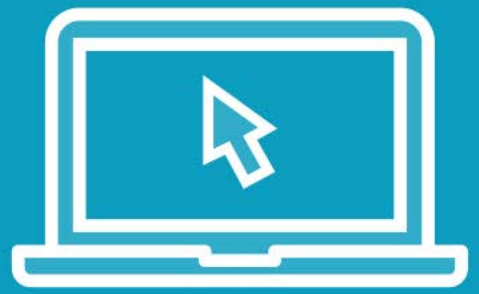
…you're gonna love this!

```
- DROP TABLE IF EXISTS dbo.Product
- DROP TRIGGER IF EXISTS trProductInsert
```

Objects That Can DIE

- AGGREGATE
- ASSEMBLY
- DATABASE
- DEFAULT
- INDEX
- PROCEDURE
- ROLE
- RULE
- SCHEMA
- SECURITY POLICY
- SEQUENCE
- SYNONYM
- TABLE
- TRIGGER
- TYPE
- VIEW

Demo



Drop If Exists (DIE)

Introducing SESSION_CONTEXT

What is "session context"?

- Stateful dictionary (key/value pair) object
  - Key is a Unicode string
  - Value is a sql_variant (any data type)
- Retains state for the lifetime of the connection
- Vast improvement over CONTEXT_INFO

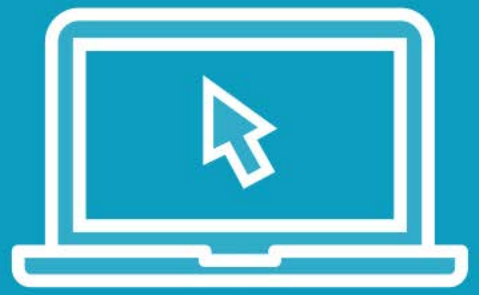
sp_set_session_context

- System stored procedure that stores a value to session context
- Specify **@key**, **@value**, and optionally, **@read_only**

SESSION_CONTEXT()

- Built-in function that returns a value from session context by key

Demo



Sharing State with SESSION_CONTEXT

Summary

Introduction and overview

Developer features in earlier SQL Server versions

SSMS vs. SSDT

Drop If Exists (DIE)

SESSION_CONTEXT