Drew Skwiers-Koballa

Azure Data Studio Extension Development

Hi

Drew Skwiers-Koballa

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www.github.com/dzsquared

Developer in the Microsoft ecosystem for 8 years, including SQL Server

Introverted but friendly

Agenda

- What is Azure Data Studio
- Why Develop Extensions
- Extension Development Framework (demo)
- Publishing an extension
- Extension Type examples
- Extension Functionality examples

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Azure Data Studio

Formerly Known as SQL Operations Studio

Multi-platform

SQL/data platform tool

Based on VS Code

Write Queries

Basic Server Management

What Does It Do

Server and Database Dashboards
Query Editing
Object Explorer
Export Results to csv/xlsx/json
Query Plan
Data Notebooks
SQL Agent
SQL Profiler
Integrated Terminal
Extension API

Blog by Vicky Harp on capabilities as of September 2018: https://cloudblogs.microsoft.com/sqlserver/2018/09/25/azure-data-studio-for-sql-server/

What Doesn't It Do

Table Designer
Object Properties Pane
Results to File/Text
Query Stats
Client Statistics
Always On
Always Encrypted
Maintenance Plans
Data Tuning Advisor
Error Log Viewer

Is Azure Data Studio Right For You?

How to Find Out

- Read capability summaries
- Watch demo videos
- Ask someone on your team to try it out
- Test it

Friendly Reminders

- Both ADS and SSMS are free
- The most recent version of ADS (v1.0) and SSMS (v17/v18 preview) work with most versions of SQL Server
- Ola Hallengren's scripts work in both

Why Develop Extensions?

Do you have an enterprise workflow?

Do you want to create a shortcut?

Do you want to share something with the SQL community?

Do you like branching out, but not too far out?

What Does It Take?

- Just about any computer
- Willingness to learn:
  - A little Git
  - A basic to intermediate understanding of Typescript
- 1 to 20+ hours

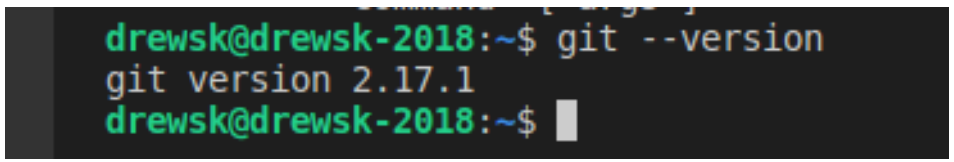
Let’s Build an Extension

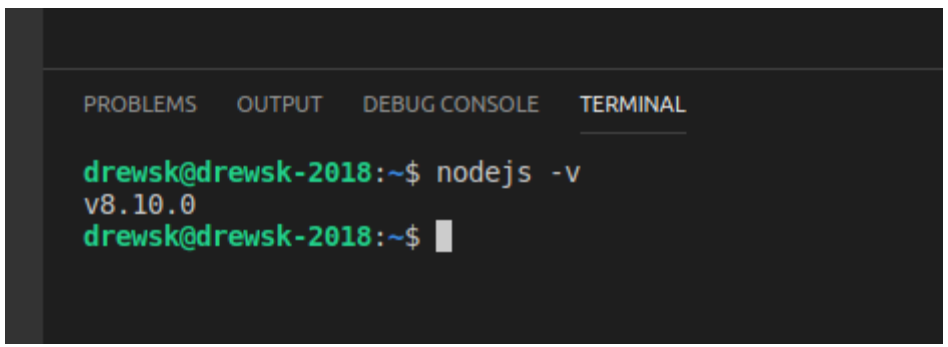
https://github.com/dzsquared/AzureDataStudio_ExtensionDevelopment

Install Prerequisites

- Azure Data Studio
- VS Code
- SQL Operations Studio Debugger extension for VS Code
- Git
- NodeJS

Checking Installs





Install Prerequisites

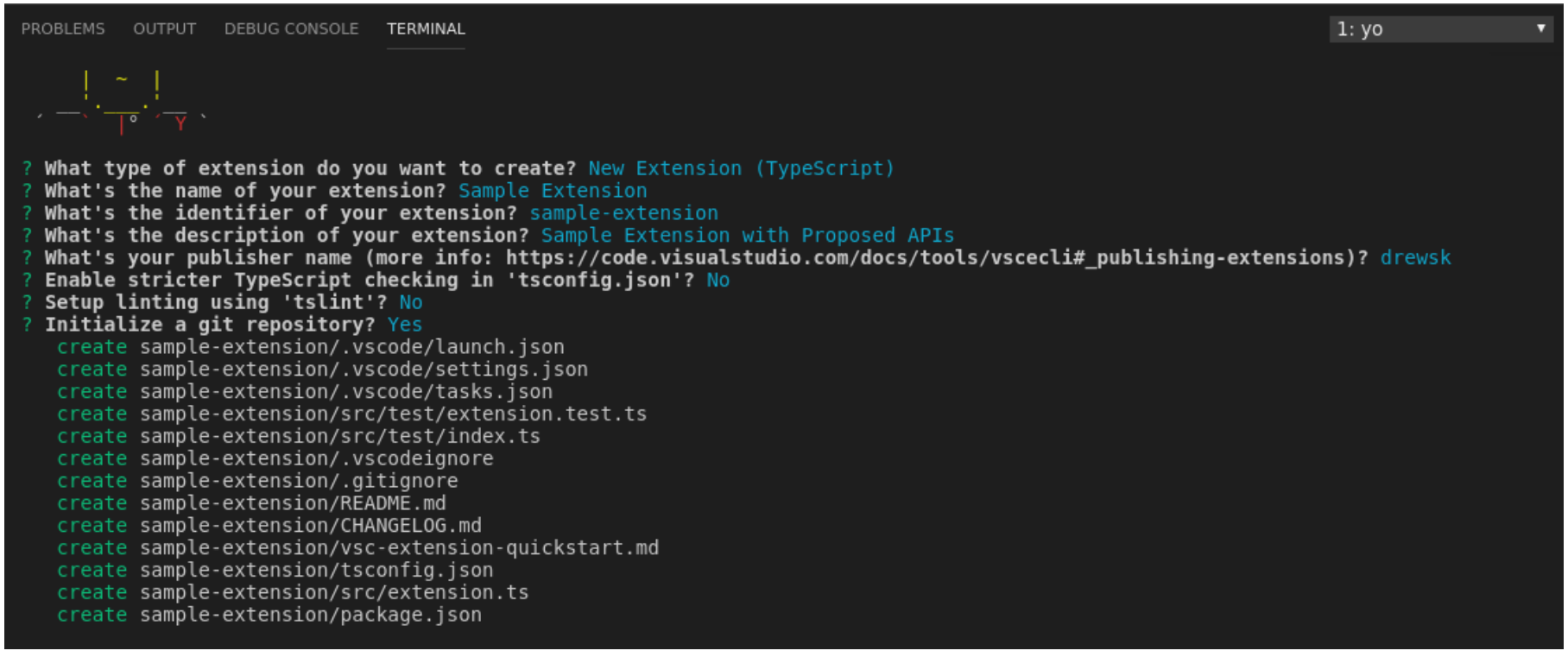
- Typescript
- Yeoman Extension Generator
- VS Code Extension Manager

```
npm install -g typescript

npm install -g yo generator-sqlops

npm install -g vsce
```

All 3 can be installed in VS Code terminal through npm
(Node Package Manager)

Yo

yo sqlops



- For this sample, leave the *Typescript Extension* selection
- Enter a name, identifier, description, and your publishing name for the extension
- Decline stricter checking and linting
- Select the initialization of a Git repository

Activation Events – package.json

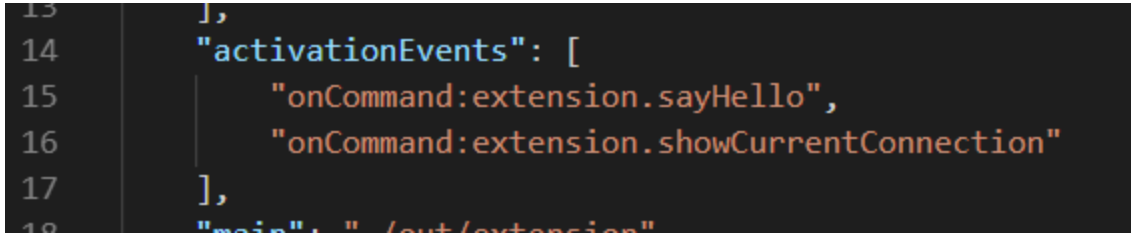
onCommand

workspaceContains

onFileSystem

onView

* *(only when necessary)*



Contribution Points – package.json

Commands

...

Configuration

Menu

Keybindings

Themes

Snippets

Dashboard

Container

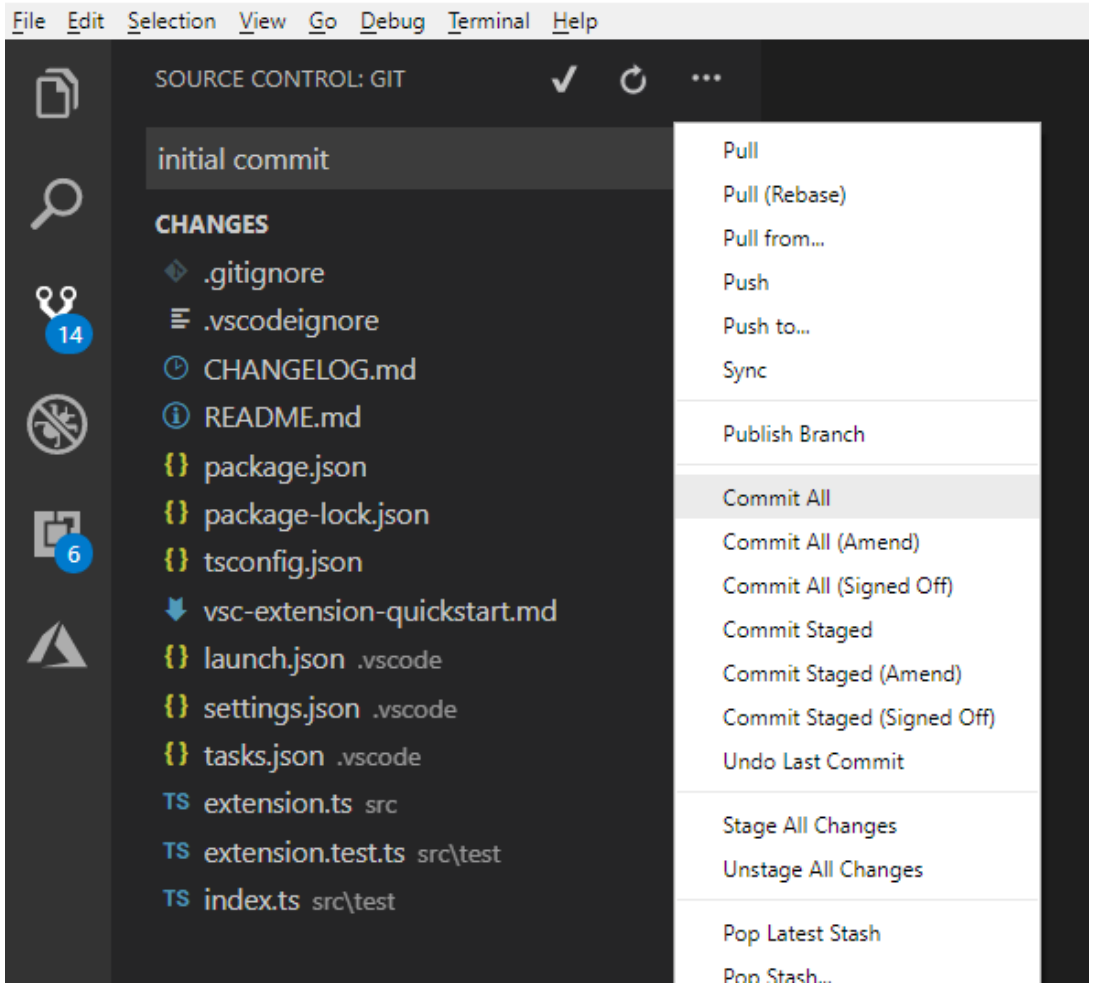
```
25    "contributes": {
26      "outputChannels": [
27        "sqlagent"
28      ],
29      "commands": [
30        {
31          "command": "agent.openNewStepDialog",
32          "title": "agent.openNewStepDialog"
33        }
34      ],
35      "dashboard.tabs": [
36        {
37          "id": "data-management-agent",
38          "description": "Manage and troubleshoot SQL Agent jobs",
39          "provider": "MSSQL",
40          "title": "SQL Agent",
41          "when": "connectionProvider == 'MSSQL' && !mssql:iscloud",
42          "container": {
43            "controlhost-container": {
44              "type": "agent"
45            }
46          }
47        }
48      ]
49    },
```

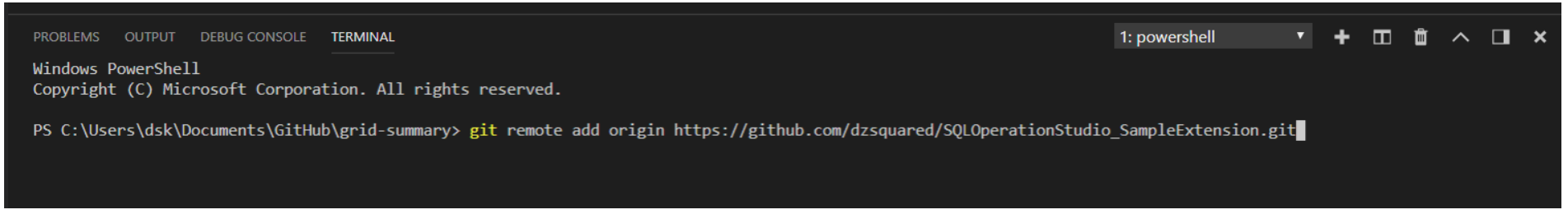
Initial Git Commit

- Open the folder for your extension in VS Code
- Stage and Commit all changes

Optional:

- Create a repository on GitHub without initializing
- Run command to add Git remote in VS Code





Test Extension

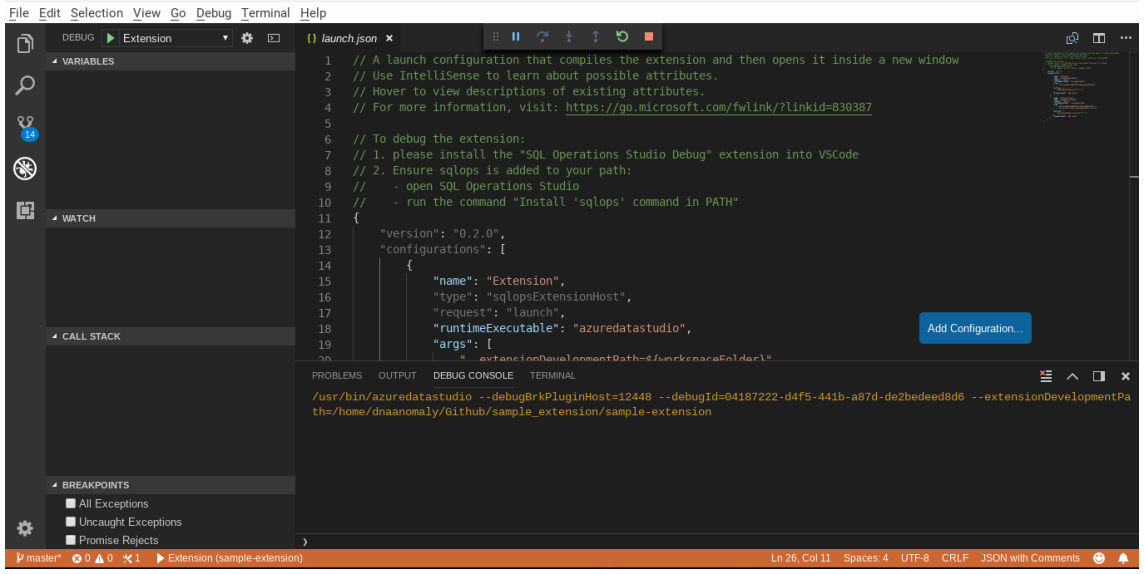
Open .vscode/launch.json

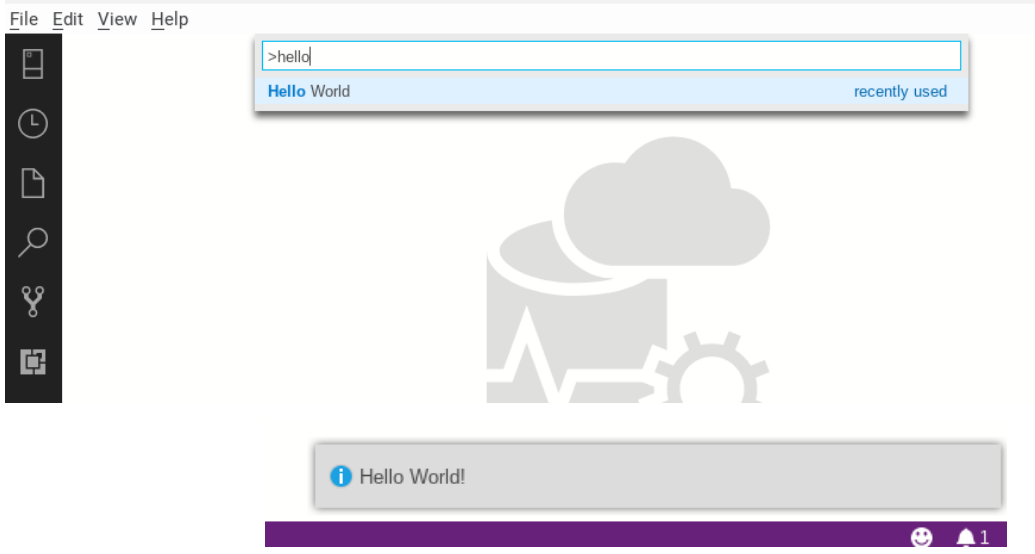
Change
“runtimeExecutable”: “sqlops”
to
“runtimeExecutable”: “azuredatastudio”

```
"configurations": [
    {
        "name": "Extension",
        "type": "sqlopsExtensionHost",
        "request": "launch",
        "runtimeExecutable": "azuredatastudio",
        "args": [
            "--extensionDevelopmentPath=${workspaceFolder}"
        ],
        "outFiles": [
            "${workspaceFolder}/out/**/*.js"
        ],
        "preLaunchTask": "npm: watch"
    },
    {
        "name": "Extension Tests",
        "type": "sqlopsExtensionHost",
        "request": "launch",
        "runtimeExecutable": "azuredatastudio",
        "args": [
            "--extensionDevelopmentPath=${workspaceFolder}",
            "--extensionTestsPath=${workspaceFolder}/out/test"
        ],
        "outFiles": [
            "${workspaceFolder}/out/test/**/*.js"
        ],
        "preLaunchTask": "npm: watch"
    }
]
```

Test Extension

Select **Start Debugging** from the **Debug** menu





A special *Extension Development* instance of ADS opens

Test the extension from the command pallette (ctrl+shift+P)

Edit The Extension

Activation events: when the extension is started

Contribution points: additions to the application

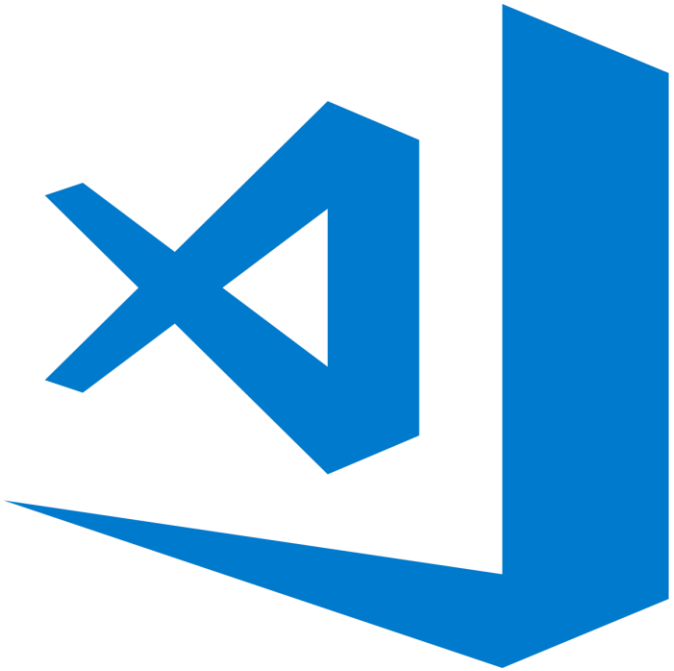
VS Code APIs + Azure Data Studio APIs

extension.ts

```ts
'use strict';

// access to VS Code and Azure Data Studio APIs and objects
import * as vscode from 'vscode';
import * as sqlops from 'sqlops';

// function called when extension is activated
export function activate(context: vscode.ExtensionContext) {

    // executed by command with the associated ID ('extension.sayHello')
    context.subscriptions.push(vscode.commands.registerCommand('extension.sayHello', () => {
        vscode.window.showInformationMessage('Hello World!');
    }));

    context.subscriptions.push(vscode.commands.registerCommand('extension.showCurrentConnection', () => {
        sqlops.connection.getCurrentConnection().then(connection => {
            let connectionId = connection ? connection.connectionId : 'No connection found!';
            vscode.window.showInformationMessage(connectionId);
        }, error => {
            console.info(error);
        });
    }));
}

// function is called when your extension is deactivated
export function deactivate() {
}
```

Available APIs – VS Code

- Messages
- Language
- Tasks
- Text Editors
- Terminal
- Status Bar
- Files/Workspace
- Webview



Available APIs – Azure Data Studio

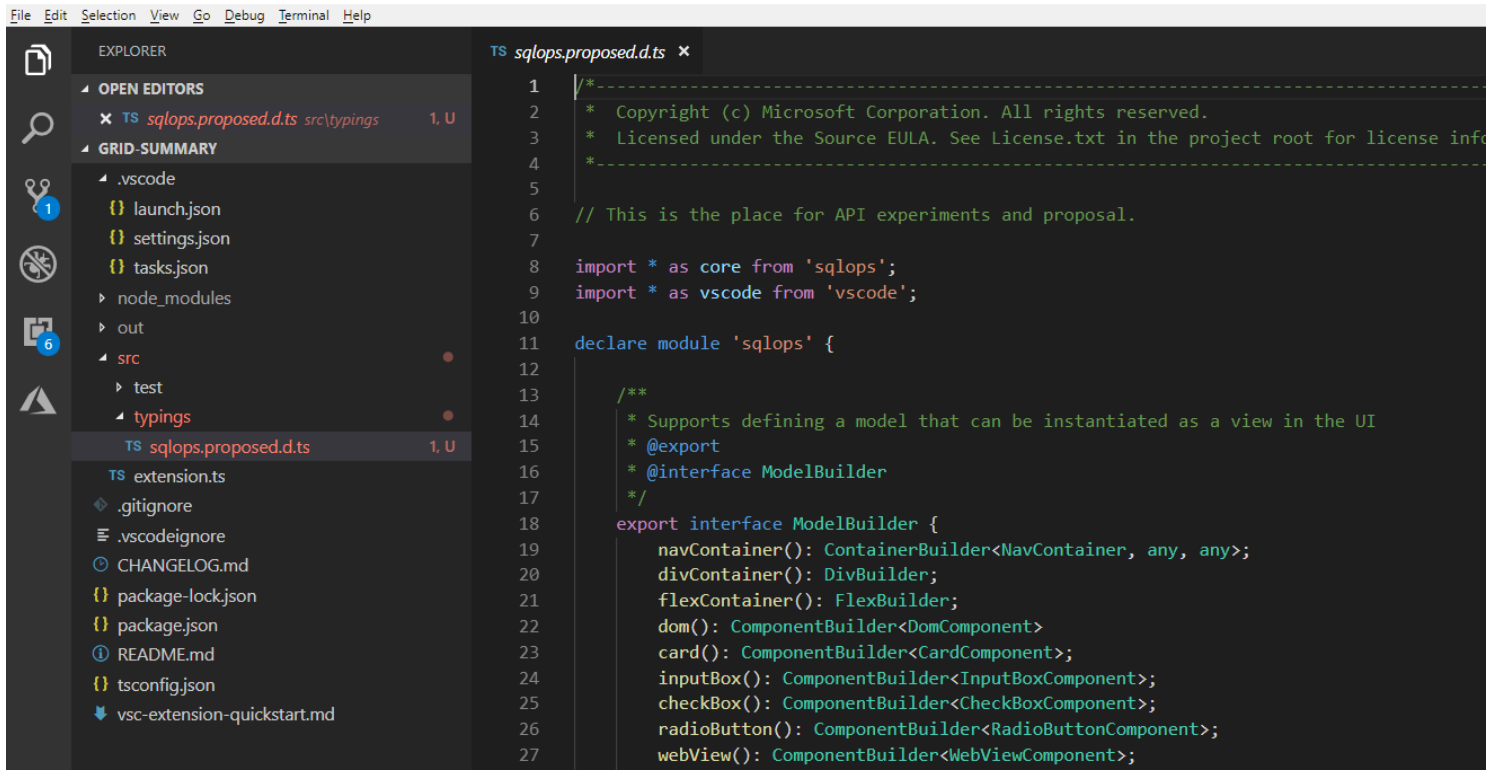
Connection management
Object Explorer
Server Info
Object Metadata
Query Manipulation
SQL Agent
Backups
XEvents

Proposed:
Dashboard containers
Wizard pages
Background operations

Using Proposed APIs

Add **typings** folder to **src** folder

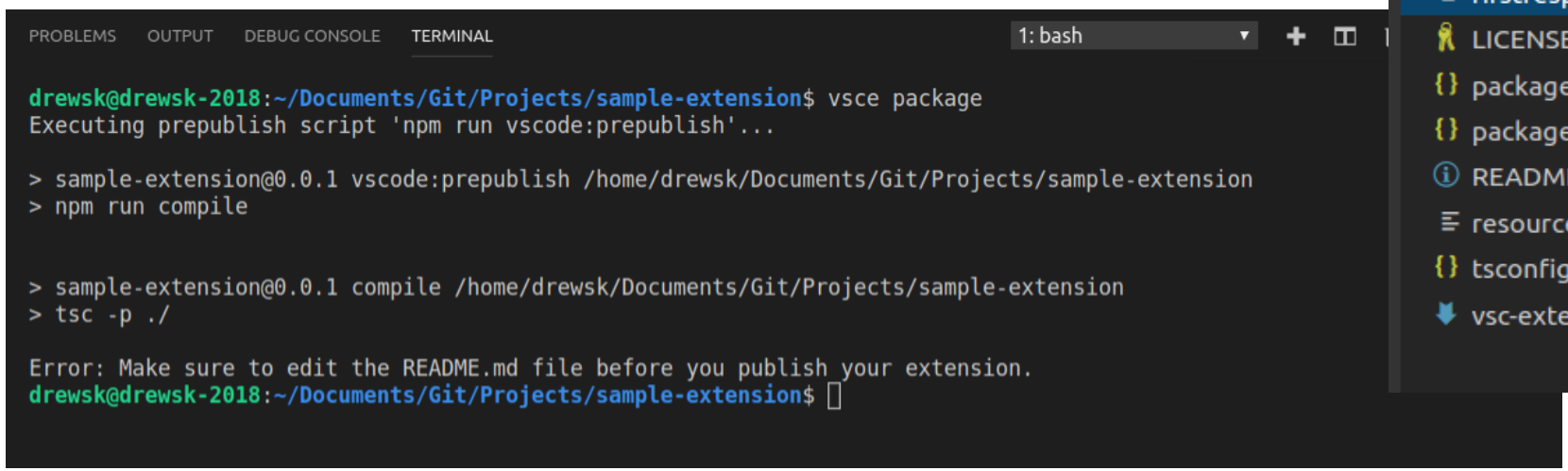
Add **sqlops.proposed.d.ts** file to folder

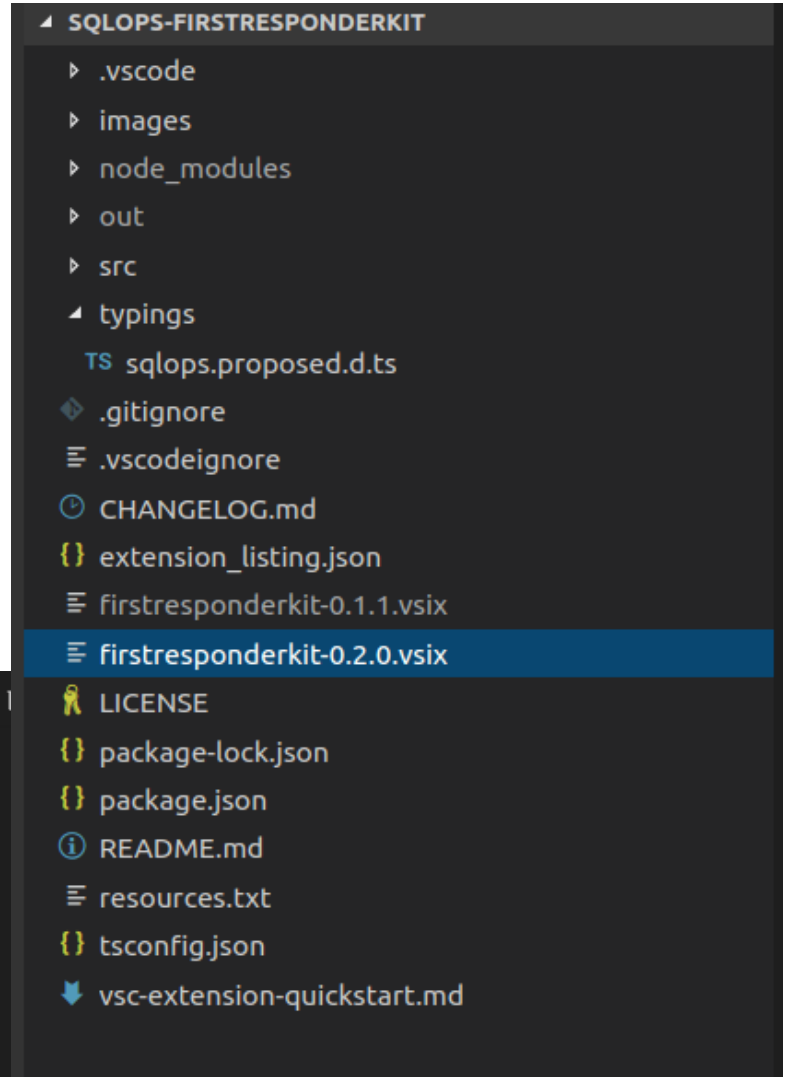


Package to .vsix

Update README.md

Run **vsce package** from terminal



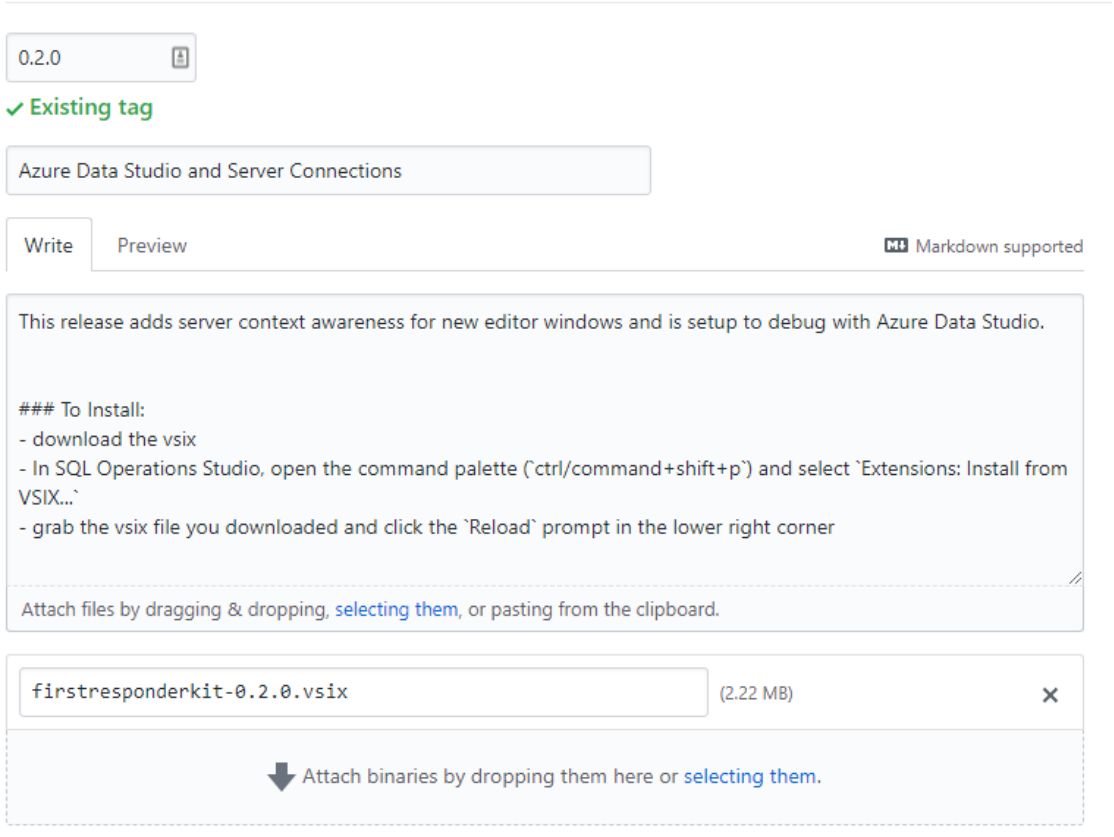


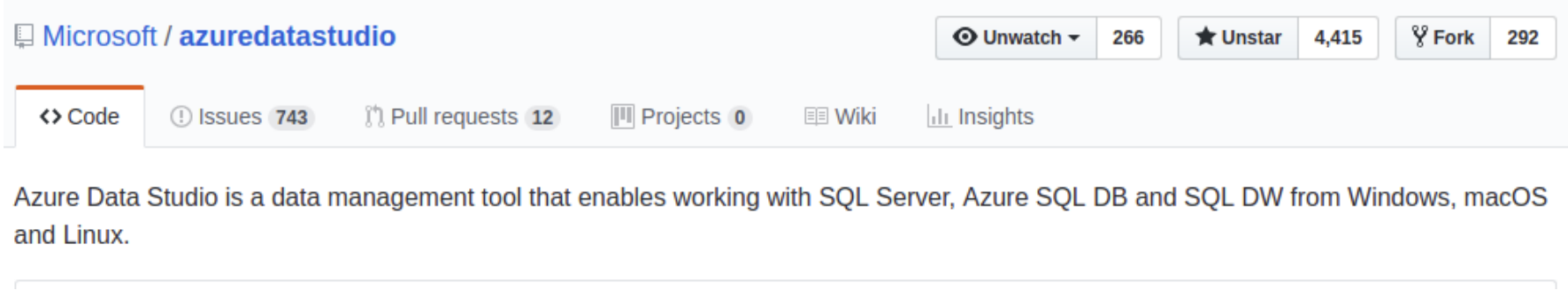
Publish Your Extension

Publish

Project hosted publicly or has an available download page

Fork the *release/extensions* tree of Azure Data Studio

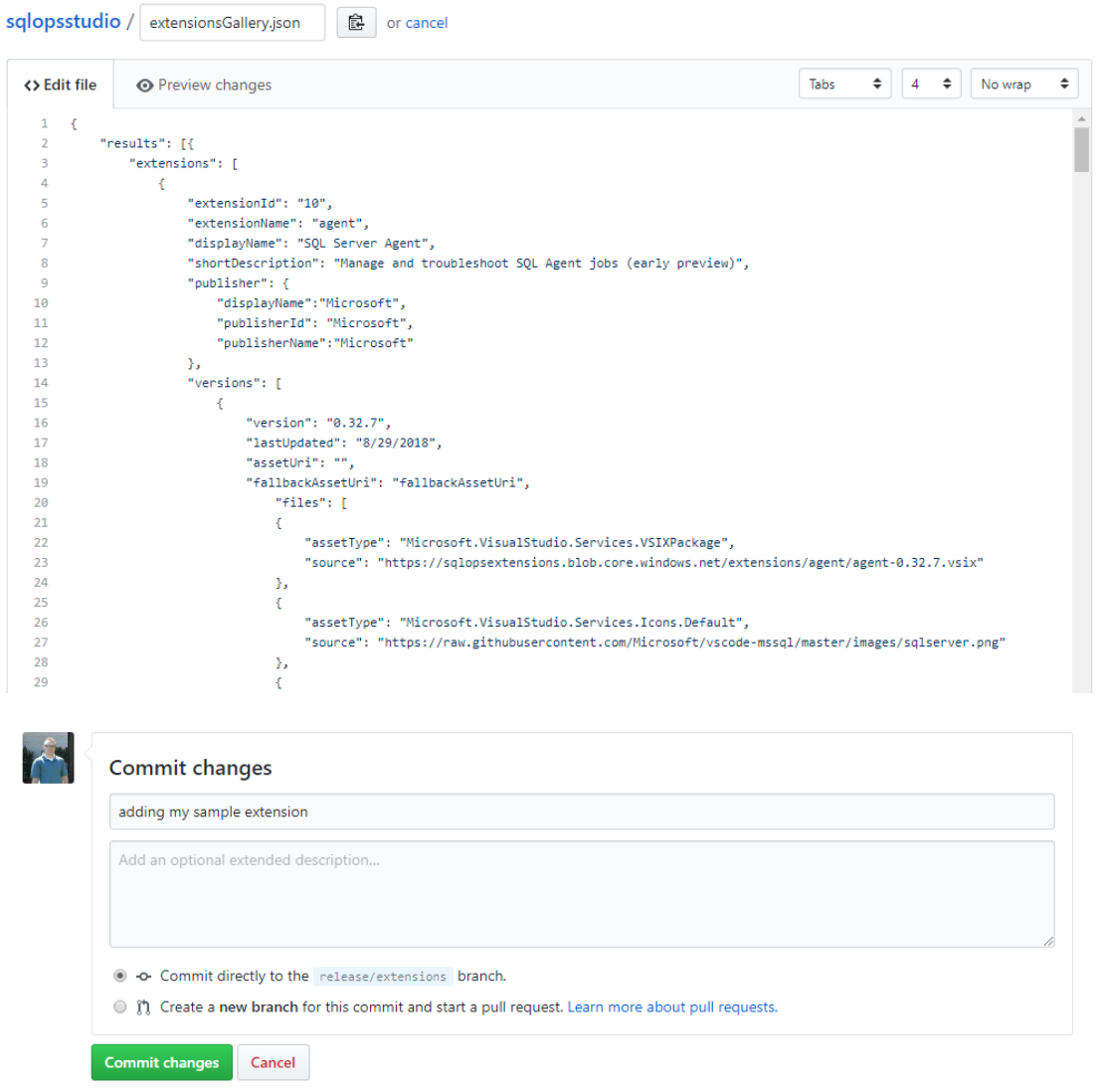




Publish

Add your extension to extensions/extensionsGallery.json

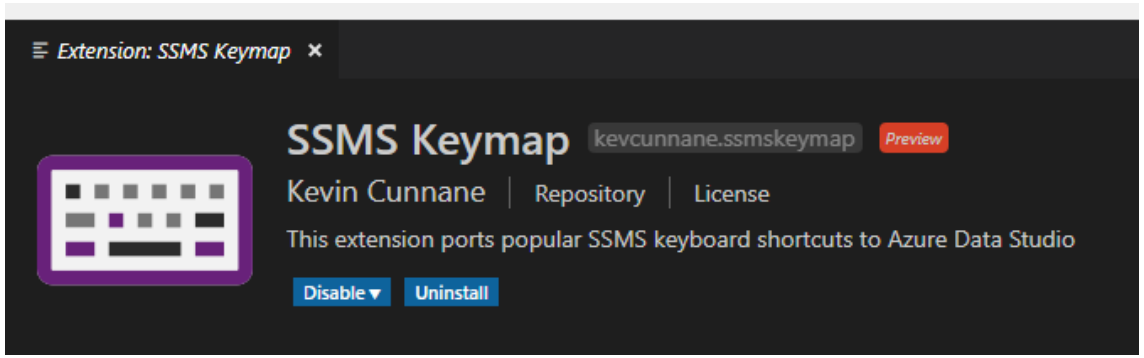
Commit changes and submit a Pull Request



Extension Types

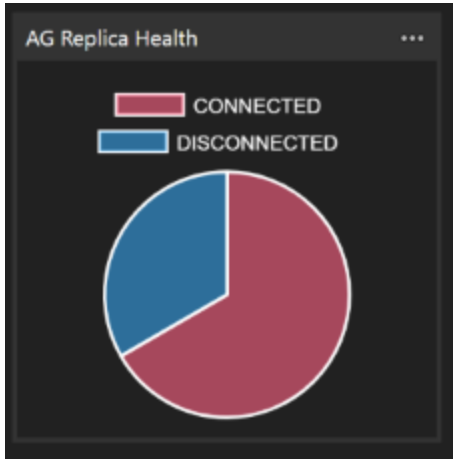
Keymap

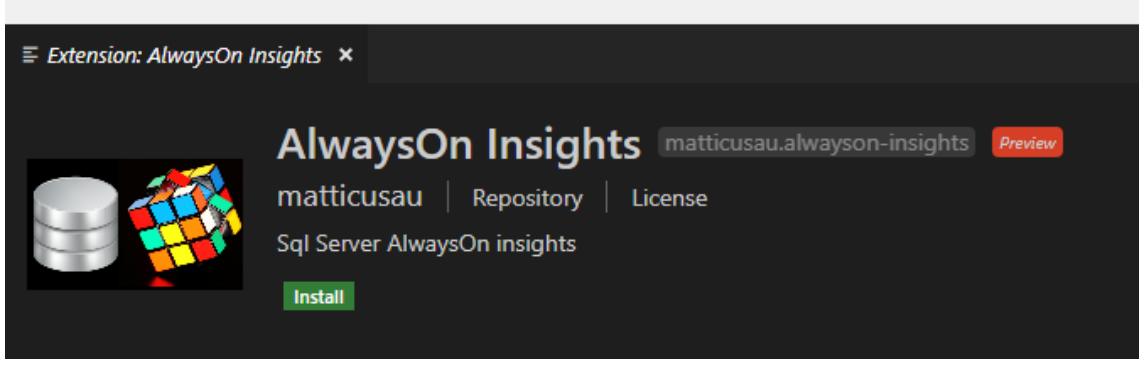
An extension that ties keystrokes to commands



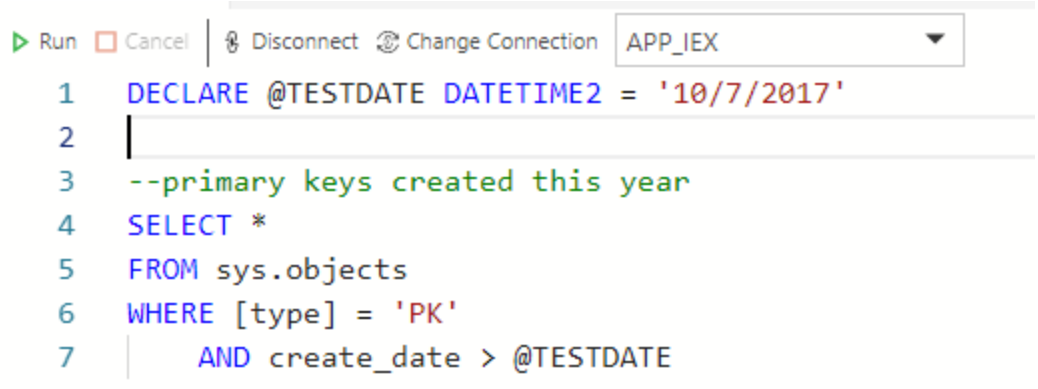
Dashboard/Insight

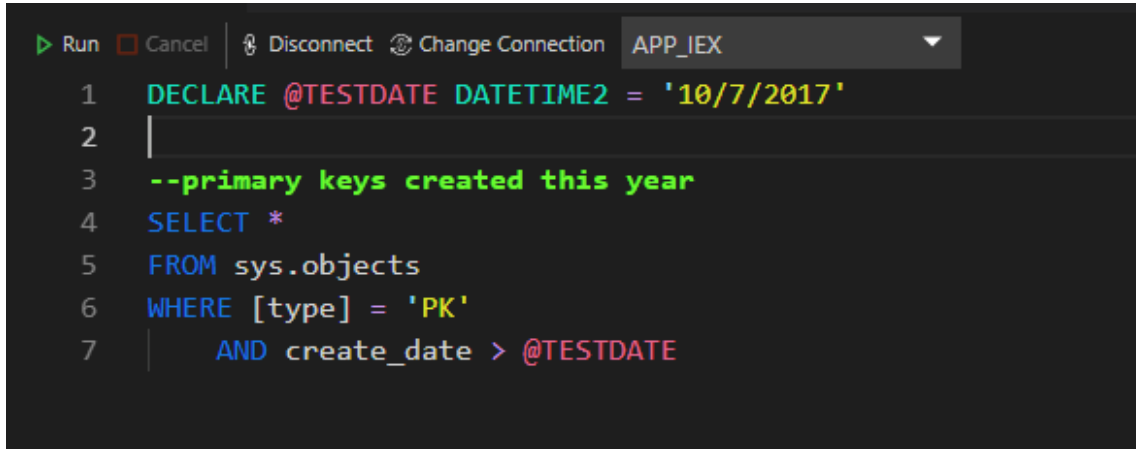
Packaged visualizations for database or server dashboards

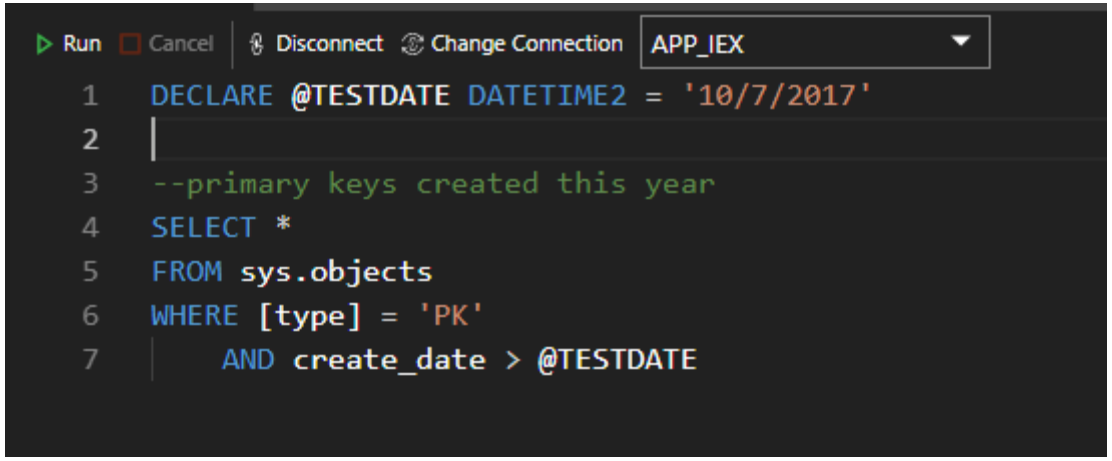


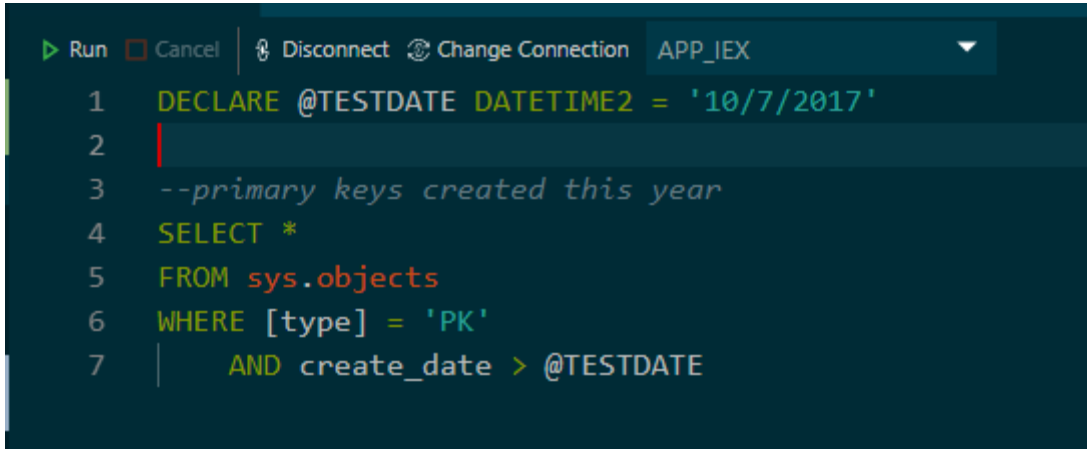


Color Themes





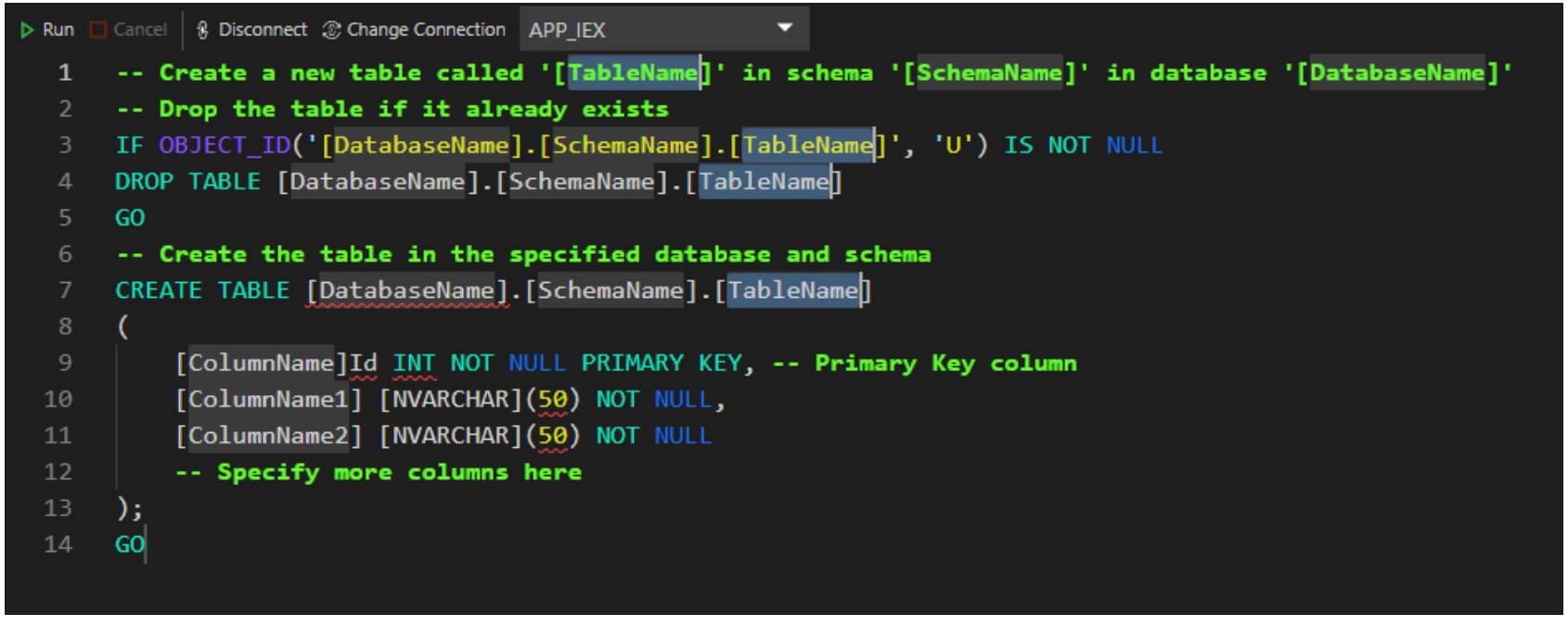




Snippets

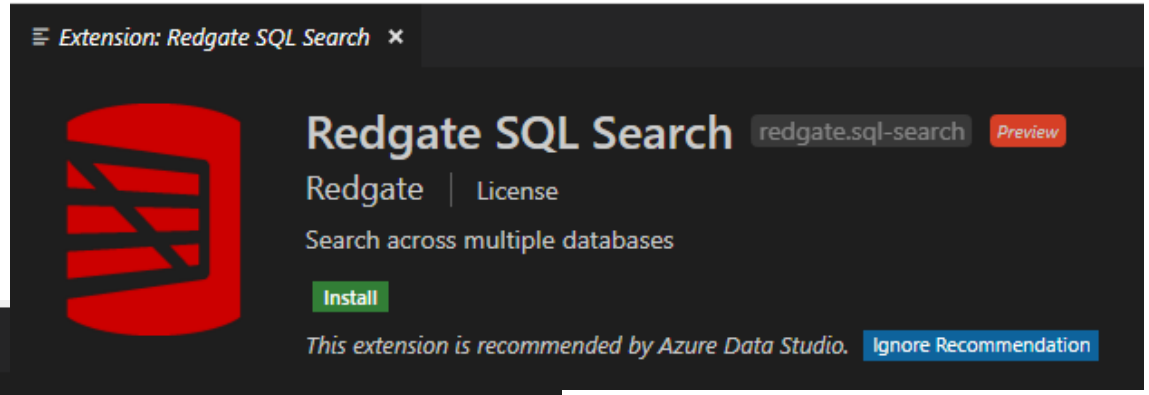
Packaged code with placeholder tab stops

Snippets can be defined per user or by an extension



Functionality Examples

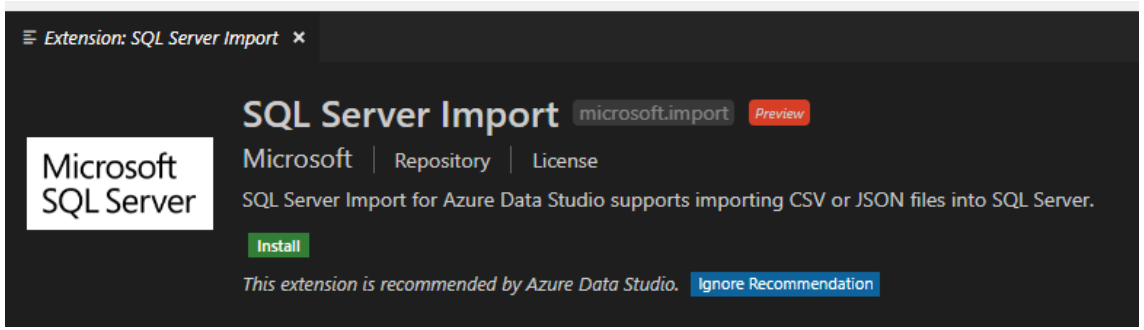
Full Webview

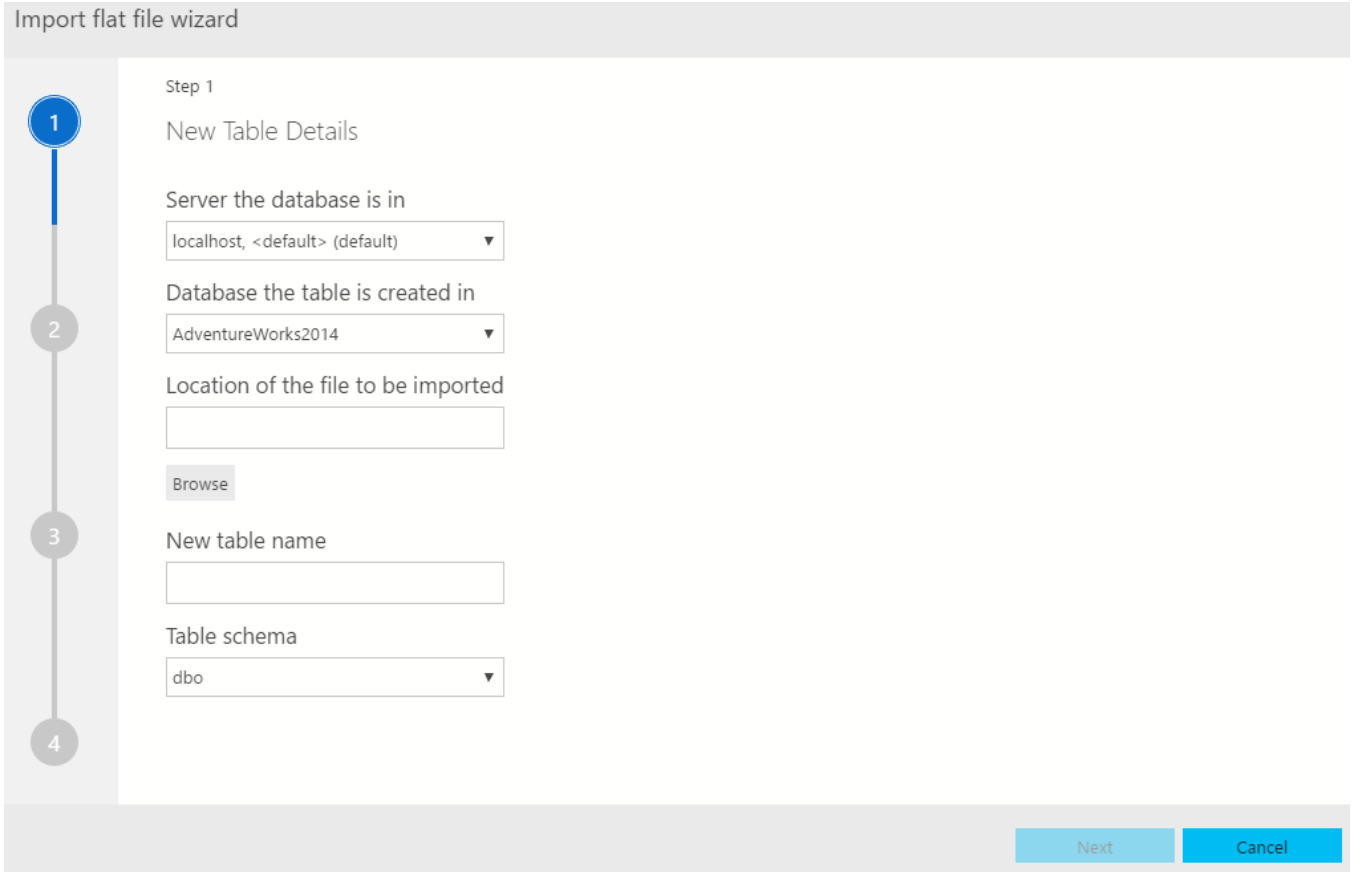


msp-sql3 | SQL Search Results: tsheets

Object name	Option	Schema	Database	Type	Matches on
TSHEETS_EMPLOYEE_ADD	⋯	dbo	APP_IEX	StoredProcedure	Text
TEAMINH_PULL_TIMESHEET	⋯	dbo	APP_IEX	StoredProcedure	Text
TEAMINH_ADD_TIMESHEET_EMP	⋯	dbo	APP_IEX	StoredProcedure	Text
TSheets_Timesheets	⋯	dbo	APP_IEX	UserTable	Column
TSheets_Employees	⋯	dbo	APP_IEX	UserTable	Column
TSHEETS_EMPLOYEE_UPDATE	⋯	dbo	APP_IEX	StoredProcedure	Text
TeamIT_TSHEETS_Keys	⋯	dbo	APP_IEX	UserTable	Column
TSHEETS_TIMESHEET_ADD	⋯	dbo	APP_IEX	StoredProcedure	Name
TSHEETS_TIMESHEET_ADD	⋯	dbo	APP_IEX	StoredProcedure	Text
PK_TSheets_Timesheets	⋯	dbo	APP_IEX	PrimaryKeyConstraint	Name
TSheets_Timesheets	⋯	dbo	APP_IEX	UserTable	Name
TSHEETS_EMPLOYEE_PROCESS	⋯	dbo	APP_IEX	StoredProcedure	Name

Wizard UI

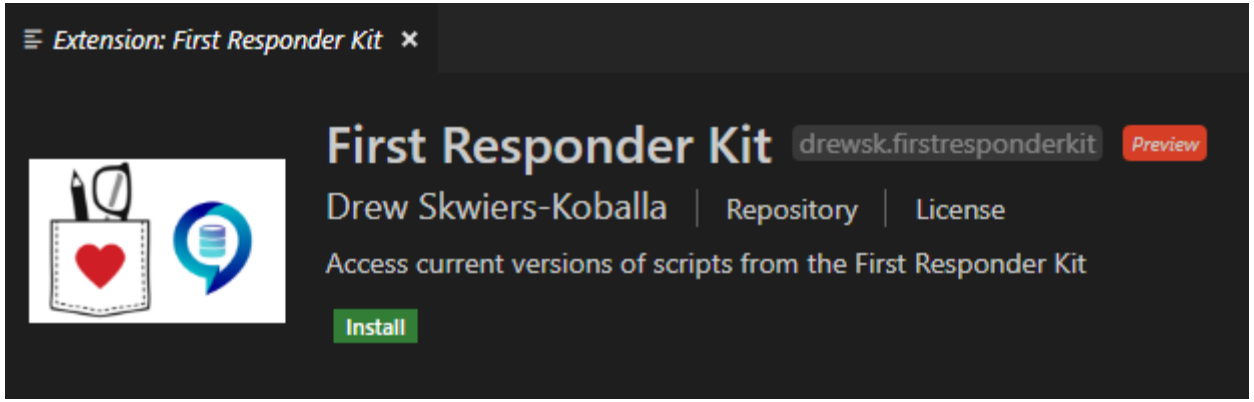




Multi-step window sequence to guide user through decisions

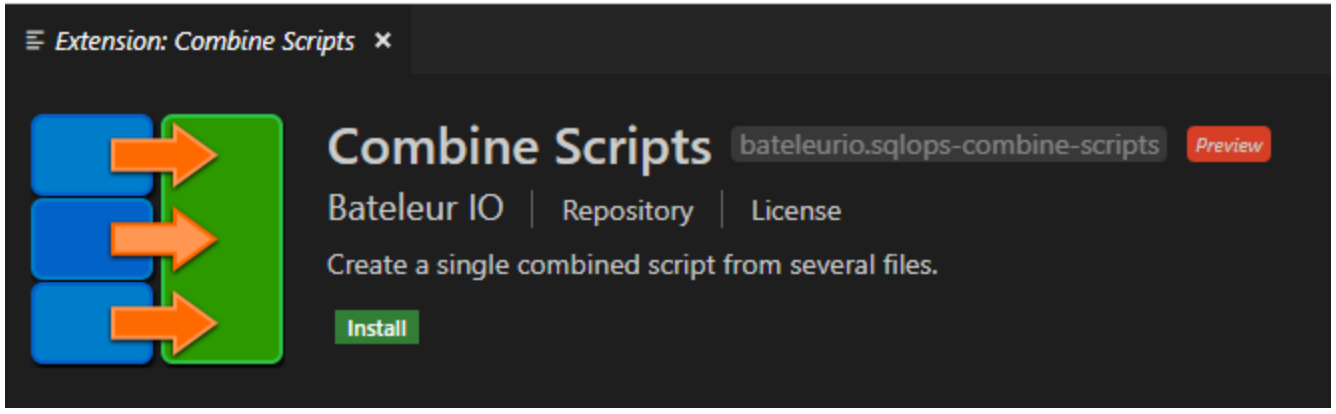
Internet Connectivity

HTTP request responses dropped to new query editor

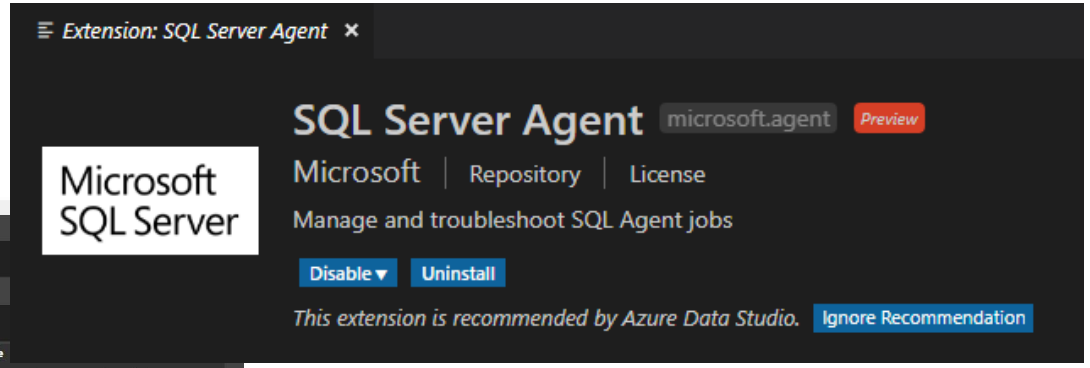


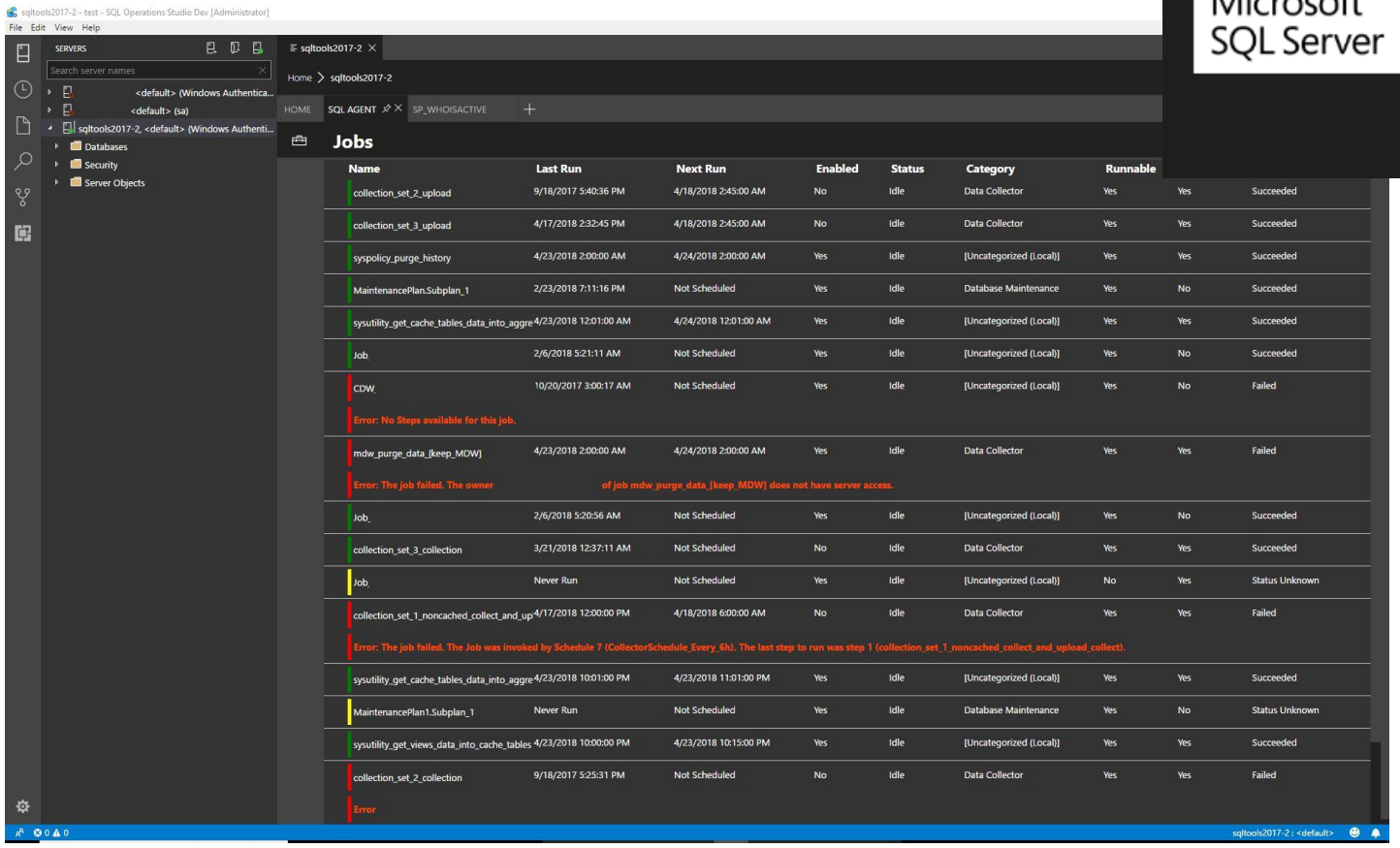
File Access

File access provided through VS Code APIs



Additional Dashboard Tab





Recap

Developing Extensions for Azure Data Studio

Additional capabilities added regularly

Opportunity to improve the toolset we have available for the data platform

Exciting time to dive in!

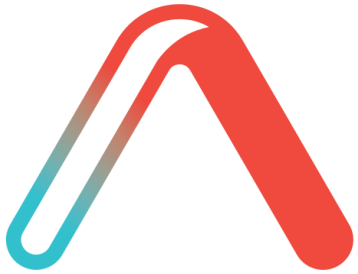
Any Questions?

SQLSaturday #796 – After Party

Location: 4th Floor of Mall of America
Time: 6:30PM – 10PM

There will be drinks and appetizers as well as free game cards and bowling!

Hang out with some new friends you've made.



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