

Project “Carbon” Private Preview (30 May 2017)

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Project “Carbon” Private Preview (30 May 2017)

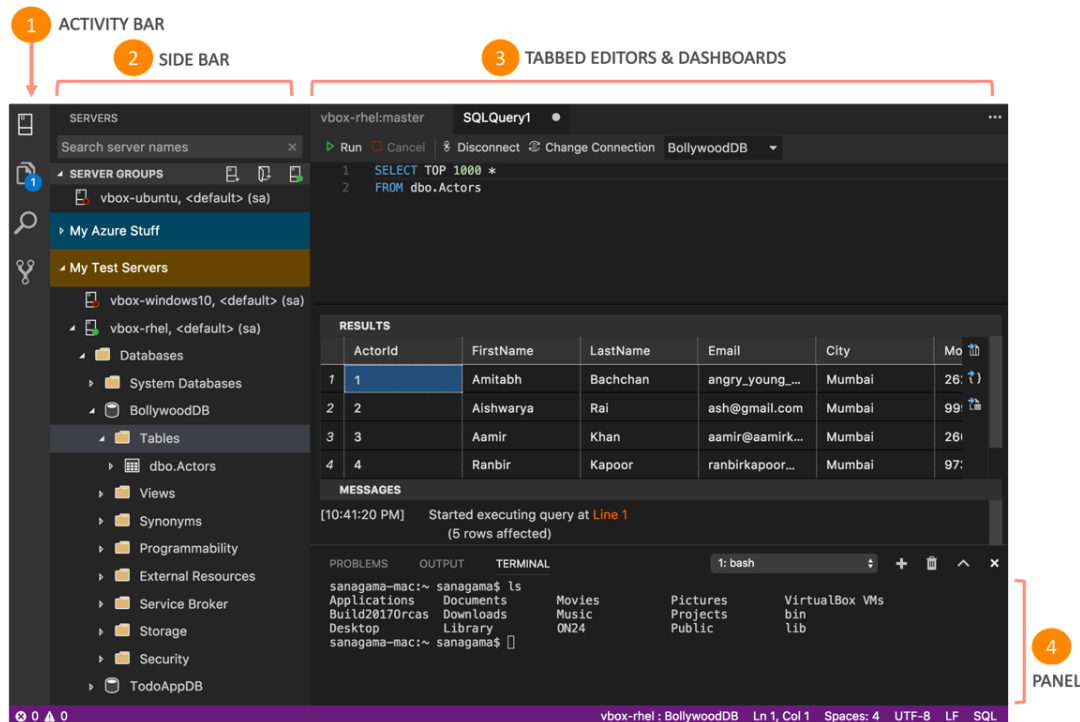
Overview

This document describes how to Download, Install and Use the private preview of project “Carbon” which is a lightweight open source multi-platform and multi-RDBMS tool designed from the ground-up for DBAs and developers.

Project “Carbon” provides DBAs & developers a modern & intuitive database management experience on their platform of choice (Linux, macOS, Windows) and simplifies Configuration, Management, Monitoring and Troubleshooting of databases everywhere. Project “Carbon” is fully extensible through open source by the OSS community and 3rd party tool vendors.

At this time, the private preview of project “Carbon” is only available to Microsoft employees, and customers, partners and MVPs who have a current NDA with Microsoft. Please contact sanagama@microsoft.com before blogging, tweeting or disclosing details publicly.

User Interface



1. ACTIVITY BAR

Provides quick access to Server Groups, File Explorer, Search and Source Control views. The buttons control what is shown in the Side Bar.

2. SIDE BAR

Displays different views like Server Groups, Files, Search and Source Control while working with your database.

3. TABBED EDITORS

The main area to edit files, execute queries & see results.

DASHBOARDS

Provides context-specific task launch points and shows general server health status.

4. PANEL

Messages, errors & warnings, and an integrated terminal to run shell commands and CLI tools.

Project “Carbon” Private Preview

Private preview details

The version number of the private preview release of project “Carbon” is: **0.1.0**

Supported SQL offerings

The private preview of project “Carbon” works with all [supported versions of SQL Server \(SQL Server 2008 - SQL Server 2017\)](#) and with [Azure SQL Database](#) and [Azure SQL Data Warehouse](#). There is no explicit block for SQL Server 2000 or SQL Server 2005, but some features may not work properly.

You can install and use project “Carbon” side-by-side with other tools you already use such as SQL Server Management Studio (SSMS), SQL Server Data Tools (SSDT), Visual Studio on Windows, Visual Studio Code and Visual Studio for Mac.

You do not need super user or administrator privileges to install and use project “Carbon”. Installing project “Carbon” is a simple xcopy and unzip experience and no system reboots are required after installation. Simply delete the unzipped files & folders to uninstall project “Carbon”.

Supported Operating Systems

Windows	Windows 10, Windows 8, Windows 7, Windows Server 2016, Windows Server 2012 (64-bit), Windows Server 2012 R2 (64-bit)
Mac	macOS 10.10 or higher
Linux	Ubuntu 16.04 or higher, CentOS 7, Red Hat Enterprise Linux (RHEL) 7.3

Reporting Issues

Please send an e-mail to sanagama@microsoft.com to report issues and submit feature ideas & suggestions.

- When you report an issue, please attach a screenshot if possible and provide clear steps to help us reproduce.
- When you submit a feature idea or suggestion, please tell us about your scenario to help us prioritize.

Installation

Windows

1. Open your browser and navigate to the private Yammer group:
<https://www.yammer.com/microsoftcommunityinfluencers/#/groups/6047103/files>
2. In the list of files, locate and download the file **2017-May-30-private-preview-carbon-windows.zip** to your computer
3. Unzip the zip file to a folder of your choice. *Tip:* use the open source [7zip](#) utility to unzip files faster.
4. Double-click **carbon.exe** in the unzipped folder to launch the application

macOS

1. Open your browser and navigate to the private Yammer group:
<https://www.yammer.com/microsoftcommunityinfluencers/#/groups/6047103/files>

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2. In the list of files, locate and download the file `2017-May-30-private-preview-carbon-macOS.zip` to your computer
3. Double-click the downloaded zip file to expand it
4. Double-click `carbon.app` to launch the application
5. Click **Open** if macOS prompts you with the dialog: This application was downloaded from the Internet. Are you sure you want to open it?
6. Optionally, drag `carbon.app` into the Applications folder to make it available in Launchpad

Linux - Ubuntu

1. Open your browser and navigate to the private Yammer group:
<https://www.yammer.com/microsoftcommunityinfluencers/#/groups/6047103/files>
2. In the list of files, locate and download the file `2017-May-30-private-preview-carbon-ubuntu.tar.gz` and save it in the `HOME` directory on your computer
3. Open a new Terminal window
4. In the Terminal window, type the following commands to extract the file and launch Carbon:

```
cd ~  
tar xvf ./2017-May-30-private-preview-carbon-ubuntu.tar.gz  
~/carbon-linux-x64/carbon
```

Linux - CentOS and Red Hat Enterprise Linux

1. Open your browser and navigate to the private Yammer group:
<https://www.yammer.com/microsoftcommunityinfluencers/#/groups/6047103/files>
2. In the list of files, locate and download the file `2017-May-30-private-preview-carbon-rhel.tar.gz` and save it in the `HOME` directory on your computer
3. Open a new Terminal window
4. In the Terminal window, type the following commands to extract the file and launch Carbon:

```
cd ~  
tar xvf ./2017-May-30-private-preview-carbon-rhel.tar.gz  
~/carbon-linux-x64/carbon
```

Additional components

Project “Carbon” has built-in support for source code control using Git but requires Git to be installed separately. Please download and install Git for your platform as described here: <https://git-scm.com/download>

Project “Carbon” Private Preview

Getting Started

This short tutorial helps you get started with project “Carbon”.

We recommend installing SQL Server 2017 CTP 2.1 on locally Windows, Linux or macOS (Docker) for the best experience with project “Carbon”. See the SQL Server documentation <https://docs.microsoft.com/en-us/sql> to install SQL Server on your platform.

Connect to SQL Server

On first launch, project “Carbon” displays the New Connection fly out on the right which you can use to connect to your recently used servers or create a new connection. You can also use the Add Server button in the SERVER side bar to connect to a server.

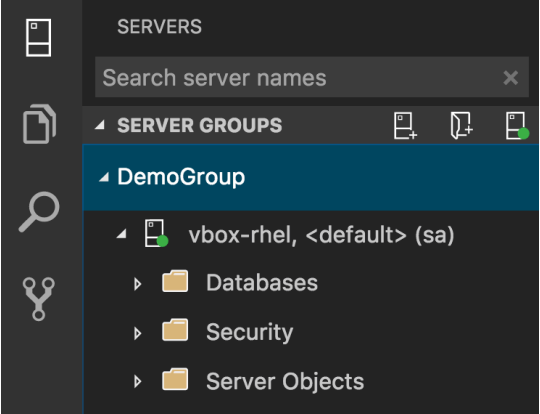
Assuming you have installed SQL Server locally on your computer and enabled SQL Server Authentication, enter the values below in the New Connection fly out:

<div><div>New Connection</div><div><div>Recent History</div><div><div><div></div><div>vbox-rhel, master (sa)</div></div><div><div></div><div>vbox-rhel, TutorialDB (sa)</div></div><div><div></div><div>vbox-rhel, TodoAppDB (sa)</div></div><div><div></div><div>vbox-rhel, BollywoodDB (sa)</div></div><div><div></div><div>vbox-ubuntu, master (sa)</div></div></div></div><div><div>Connection Type</div><div>Microsoft SQL Server</div></div><div><div>Server Name</div><div></div></div><div><div>Authentication Type</div><div>SQL Login</div></div><div><div>User Name</div><div></div></div><div><div>Password</div><div></div></div><div><div><input type="checkbox"/> Remember Password</div></div><div><div>Database Name</div><div></div></div><div><div>Server Group</div><div><Default></div></div><div><div>Advanced...</div></div><div><div>Connect</div><div>Cancel</div></div></div>	<table><tr><td>Connection Type</td><td>Select “Microsoft SQL Server”</td></tr><tr><td>Server Name</td><td>Enter localhost</td></tr><tr><td>Authentication Type</td><td>Select SQL Login</td></tr><tr><td>User Name</td><td>Enter the user name with access to a database on the server (e.g. SA).</td></tr><tr><td>Password</td><td>Enter the password for the specified user.</td></tr><tr><td>Remember Password</td><td>Leave unchecked to be prompted for the password each time you use this connection.</td></tr><tr><td>Database Name</td><td>Leave empty to connect to master by default.</td></tr><tr><td>Server Group</td><td>Click the dropdown and choose Add New Group . . . Follow the prompts to create a new server group called DemoGroup</td></tr></table>	Connection Type	Select “Microsoft SQL Server”	Server Name	Enter localhost	Authentication Type	Select SQL Login	User Name	Enter the user name with access to a database on the server (e.g. SA).	Password	Enter the password for the specified user.	Remember Password	Leave unchecked to be prompted for the password each time you use this connection.	Database Name	Leave empty to connect to master by default.	Server Group	Click the dropdown and choose Add New Group . . . Follow the prompts to create a new server group called DemoGroup
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Database Name	Leave empty to connect to master by default.																
Server Group	Click the dropdown and choose Add New Group . . . Follow the prompts to create a new server group called DemoGroup																

Click **Connect** to connect to the server and add the connection to the DemoGroup server group in the SERVERS side bar

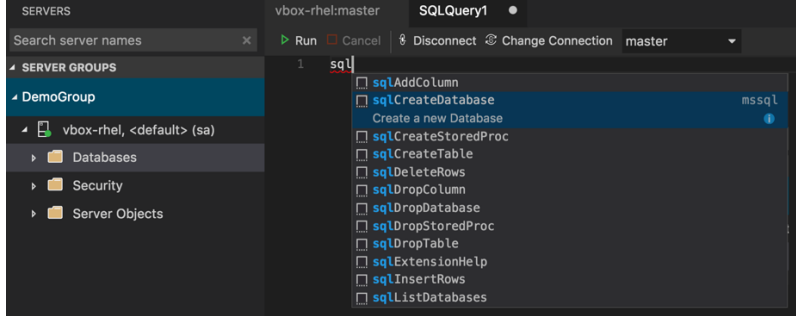
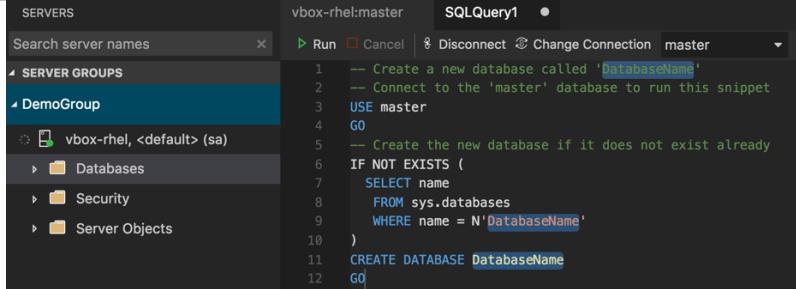
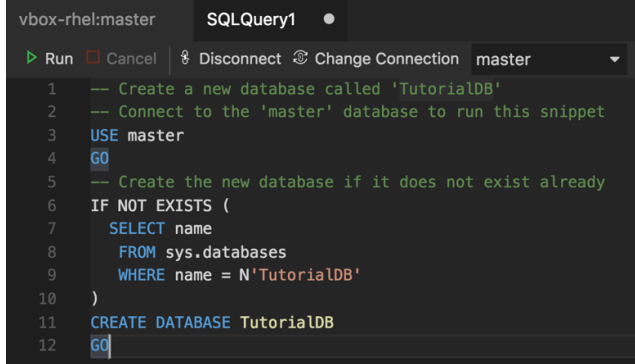
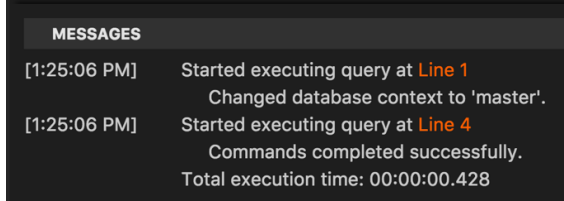
Project “Carbon” Private Preview

The SERVERS side bar should look similar to the picture below. The server you connected to should be visible under the DemoGroup server group. The table below has a brief description of the various nodes and commands available:

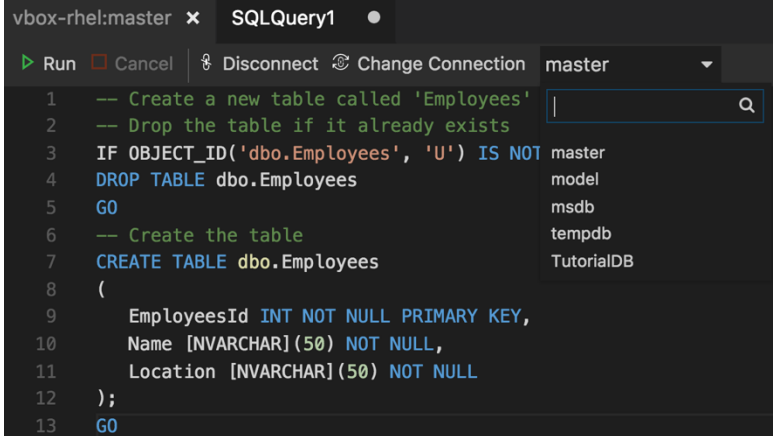
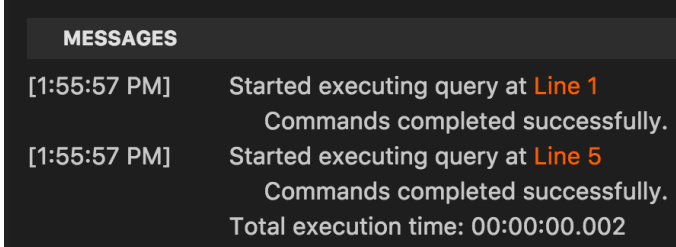
	Search	Quickly lets you search for servers in groups.
	SERVER GROUPS	Shows connections that you added to a group when you created the connection. Connections in the <Default> group are shown first followed by any custom groups you create. The SERVER GROUPS node has the following buttons: New Connection: launches the connection fly out to add a new connection Add Server Group: launches the server group fly out to add a new group Show Active Connections: filters nodes to show active (connected) servers.
	Group Node (e.g. DemoGroup)	Shows the group name and the connections in the group in a tree view Right-click the group node to use the following commands: Rename Group: rename the group inline Delete Group: delete the group including the connections within the group
	Server Nodes (e.g. vbox-rhel, localhost, etc.)	Shows the servers you are connected to along with the default database and the login user name. A green icon next to the server name indicates an active connection. A red icon next to the server name indicates a disconnected connection. Right-click the server node to use the following commands: Connect/Disconnect: connect or disconnect New Query: open a new query editor window Delete Connection: disconnect and delete this connection Refresh: refresh metadata for this connection
	Databases Node	Expand the server node to see databases and other objects in a tree view. Right-click the database node to use the following commands: New Query: open a new query editor window connected to this server Refresh: refresh metadata for this connection

Create a Database

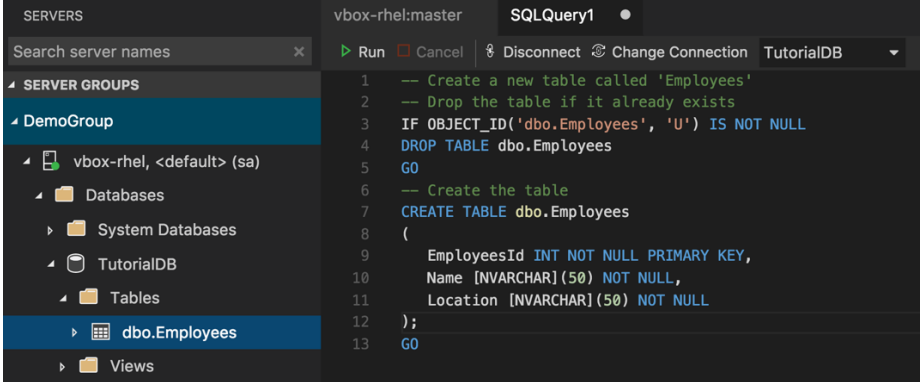
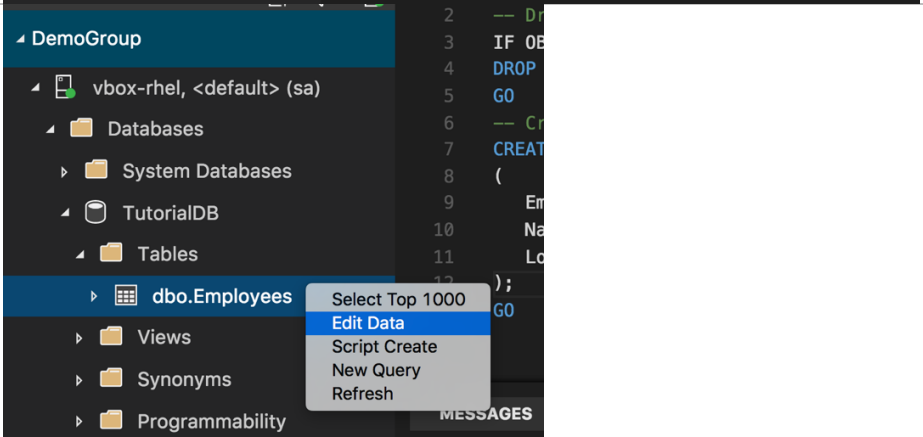
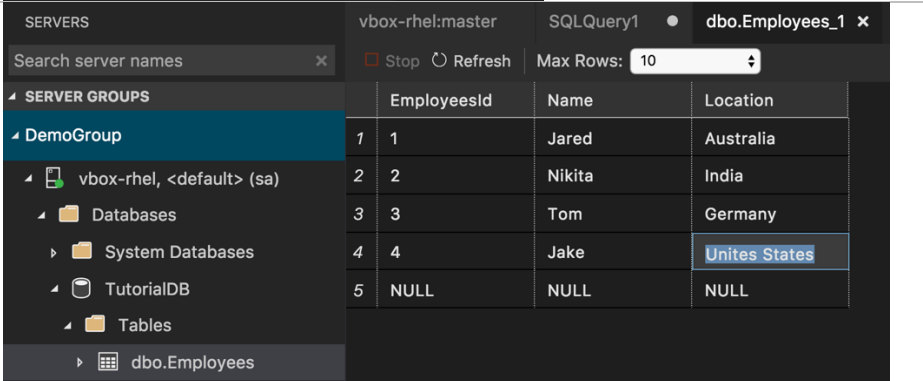
Right-click the **Databases** node under your server and choose **New Query** to open a new query editor window and type the commands below to create the **TutorialDB** database.

<ol style="list-style-type: none"> 1. Type the word sql in the editor window to display a list of T-SQL snippets to help you get started. 2. Click on the sqlCreateDatabase snippet to insert the T-SQL snippet into the editor window. 	
<ol style="list-style-type: none"> 3. Type TutorialDB to change all 3 occurrences of the text DatabaseName to TutorialDB at once. 	
<ol style="list-style-type: none"> 4. Your T-SQL statement should look like this. 	 <pre> 1 -- Create a new database called 'TutorialDB' 2 -- Connect to the 'master' database to run this snippet 3 USE master 4 GO 5 -- Create the new database if it does not exist already 6 IF NOT EXISTS (7 SELECT name 8 FROM sys.databases 9 WHERE name = N'TutorialDB' 10) 11 CREATE DATABASE TutorialDB 12 GO </pre>
<ol style="list-style-type: none"> 5. Click the Run button or press F5 to execute the T-SQL statement and create the database. 6. You should see a message similar to the one on the right. 	 <pre> MESSAGES [1:25:06 PM] Started executing query at Line 1 Changed database context to 'master'. [1:25:06 PM] Started executing query at Line 4 Commands completed successfully. Total execution time: 00:00:00.428 </pre>

Create a Table

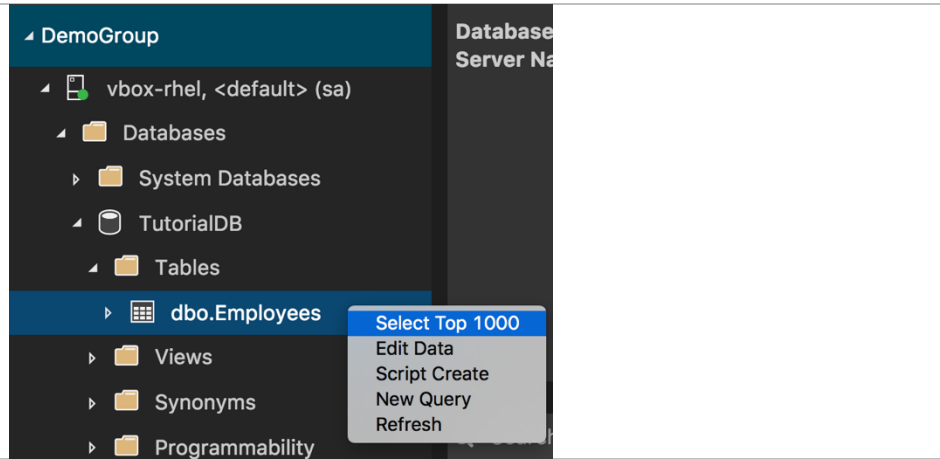
<ol style="list-style-type: none"> 1. Delete all the T-SQL text in the editor window. 2. Copy and paste the T-SQL snippet shown on the right into the query editor window to create the Employees table. 	<pre>-- Create a new table called 'Employees' -- Drop the table if it already exists IF OBJECT_ID('dbo.Employees', 'U') IS NOT NULL DROP TABLE dbo.Employees GO -- Create the table CREATE TABLE dbo.Employees (EmployeesId INT NOT NULL PRIMARY KEY, Name [NVARCHAR](50) NOT NULL, Location [NVARCHAR](50) NOT NULL); GO</pre>
<ol style="list-style-type: none"> 3. Change the current database from master to TutorialDB. Click the database dropdown and select TutorialDB. 	
<ol style="list-style-type: none"> 4. Click the Run button or press F5 to execute the T-SQL statement and create the table. 5. You should see a message similar to the one on the right. 	

Insert data into a Table

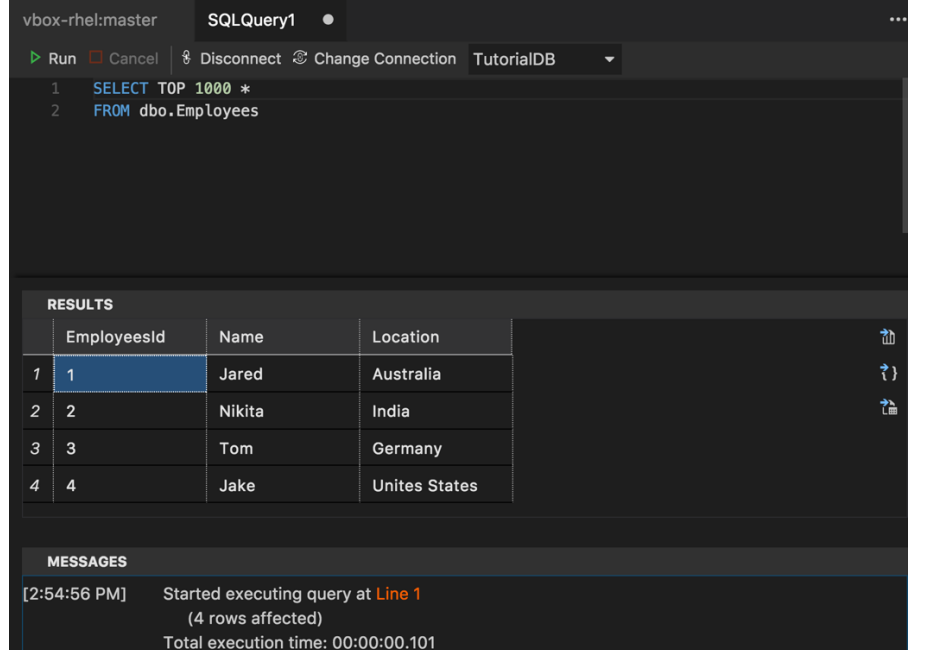
<ol style="list-style-type: none"> Under Server Groups, expand TutorialDB database node. Under the TutorialDB node, expand the Tables node to see the dbo.Employees table. 	 <p>The screenshot shows the SQL Server Enterprise Manager interface. On the left, the 'SERVERS' pane is expanded to show 'vbox-rhel, <default> (sa)' > 'Databases' > 'TutorialDB' > 'Tables' > 'dbo.Employees'. The right pane shows a SQL query window titled 'SQLQuery1' with the following code:</p> <pre> 1 -- Create a new table called 'Employees' 2 -- Drop the table if it already exists 3 IF OBJECT_ID('dbo.Employees', 'U') IS NOT NULL 4 DROP TABLE dbo.Employees 5 GO 6 -- Create the table 7 CREATE TABLE dbo.Employees 8 (9 EmployeesId INT NOT NULL PRIMARY KEY, 10 Name [NVARCHAR](50) NOT NULL, 11 Location [NVARCHAR](50) NOT NULL 12); 13 GO </pre>																		
<ol style="list-style-type: none"> Right-click the dbo.Employees table and choose Edit Data from the context menu to display the Data Editor. 	 <p>The screenshot shows the same SQL Server Enterprise Manager interface as above, but with the 'dbo.Employees' table right-clicked. A context menu is open, showing options: 'Select Top 1000', 'Edit Data' (highlighted), 'Script Create', 'New Query', and 'Refresh'.</p>																		
<ol style="list-style-type: none"> Enter the values shown on the right in Data Editor. Enter a value in a column and press the TAB key to move to the next column. Press the TAB key in the last column (Location) to insert a new row. The values you enter are validated against the table schema before they are saved to the database. 	 <p>The screenshot shows the 'Data Editor' for the 'dbo.Employees' table. The table has three columns: 'EmployeesId', 'Name', and 'Location'. The data is as follows:</p> <table border="1"> <thead> <tr> <th>EmployeesId</th> <th>Name</th> <th>Location</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Jared</td> <td>Australia</td> </tr> <tr> <td>2</td> <td>Nikita</td> <td>India</td> </tr> <tr> <td>3</td> <td>Tom</td> <td>Germany</td> </tr> <tr> <td>4</td> <td>Jake</td> <td>Unites States</td> </tr> <tr> <td>5</td> <td>NULL</td> <td>NULL</td> </tr> </tbody> </table> <p>The 'Unites States' value in the 'Location' column for row 4 is highlighted with a blue selection box.</p>	EmployeesId	Name	Location	1	Jared	Australia	2	Nikita	India	3	Tom	Germany	4	Jake	Unites States	5	NULL	NULL
EmployeesId	Name	Location																	
1	Jared	Australia																	
2	Nikita	India																	
3	Tom	Germany																	
4	Jake	Unites States																	
5	NULL	NULL																	

View data in a Table

1. Right-click the **dbo.Employees** table and choose **Select Top 1000** to display data.



The screenshot shows the SQL Server Enterprise Manager interface. The left pane displays the 'DemoGroup' tree structure, including 'vbox-rhel, <default> (sa)', 'Databases', 'System Databases', 'TutorialDB', and 'Tables'. The 'dbo.Employees' table is selected, and a context menu is open with the following options: 'Select Top 1000', 'Edit Data', 'Script Create', 'New Query', and 'Refresh'. The 'Select Top 1000' option is highlighted.



The screenshot shows the SQL Query window with the query 'SELECT TOP 1000 * FROM dbo.Employees' executed. The results are displayed in a table with the following columns: 'EmployeesId', 'Name', and 'Location'. The results show 4 rows of data.




	EmployeesId	Name	Location
1	1	Jared	Australia
2	2	Nikita	India
3	3	Tom	Germany
4	4	Jake	Unites States

The 'MESSAGES' pane shows the execution details: '[2:54:56 PM] Started executing query at Line 1 (4 rows affected) Total execution time: 00:00:00.101'.

2. Use the mouse or keyboard to navigate the results

Project “Carbon” Private Preview

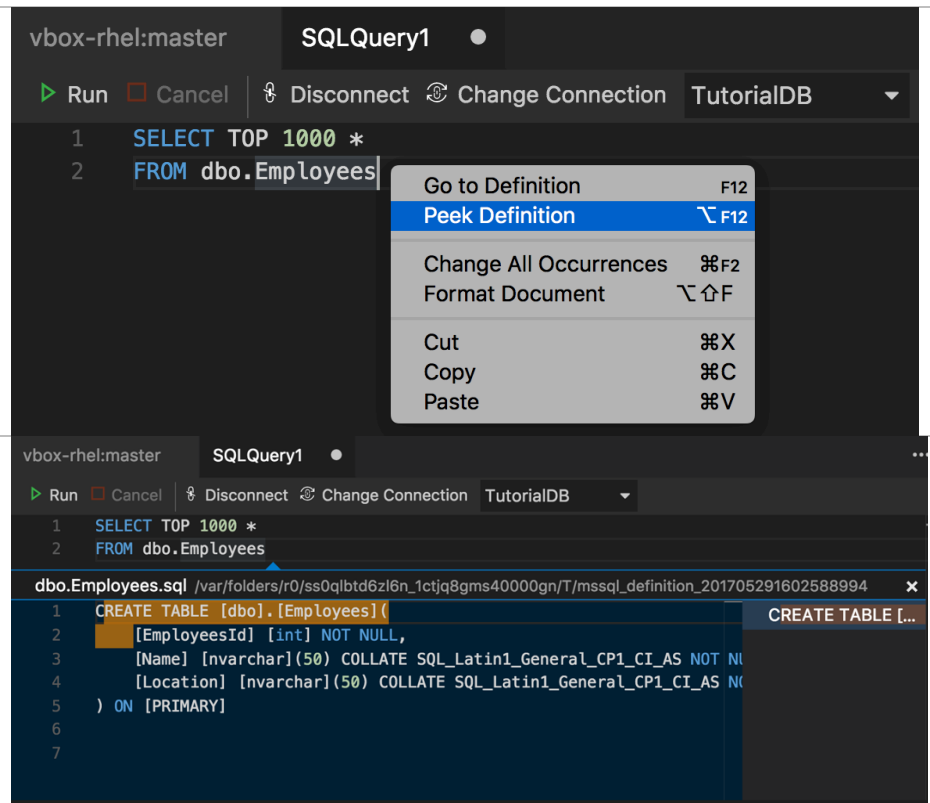
Save results as JSON, CSV or Excel

1. Click the  icon and follow the prompts to save results as JSON and open the file.
2. Click the  icon and follow the prompts to save results as CSV and open the file.
3. Click the  icon and follow the prompts to save results as Excel and open the file.

RESULTS			
	EmployeesId	Name	Location
1	1	Jared	Australia
2	2	Nikita	India
3	3	Tom	Germany
4	4	Jake	Unites States

Quickly inspect table schema

1. In the editor window, right-click **dbo.Employees** and choose **Peek Definition** from the context menu.
2. See the definition of the **dbo.Employees** table inline in the editor window.
3. Optionally, click **CREATE TABLE** to generate a T-SQL script to create the **dbo.Employees** in a new editor window.



The screenshot shows the SQLQuery1 editor window. The top toolbar includes buttons for Run, Cancel, Disconnect, Change Connection, and TutorialDB. The SQL query is:

```
1 SELECT TOP 1000 *
2 FROM dbo.Employees
```

A context menu is open over the text 'dbo.Employees', showing options: Go to Definition (F12), Peek Definition (⇧F12), Change All Occurrences (⌘F2), Format Document (⇧⌘F), Cut (⌘X), Copy (⌘C), and Paste (⌘V). The 'Peek Definition' option is selected.

Below the query, the table definition for 'dbo.Employees' is displayed in a separate window titled 'dbo.Employees.sql':


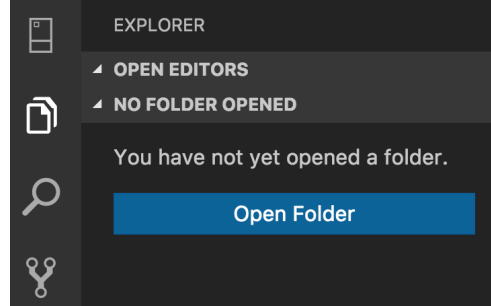
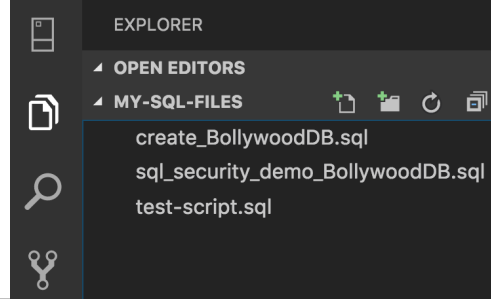
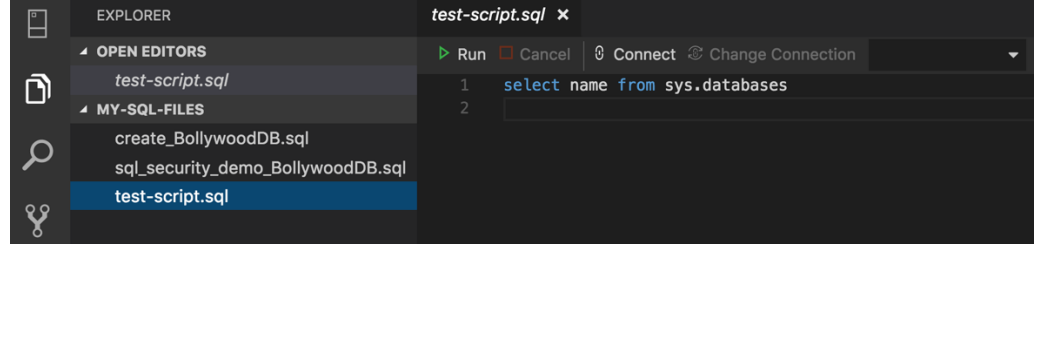
```
1 CREATE TABLE [dbo].[Employees](
2     [EmployeesId] [int] NOT NULL,
3     [Name] [nvarchar](50) COLLATE SQL_Latin1_General_CP1_CI_AS NOT NULL,
4     [Location] [nvarchar](50) COLLATE SQL_Latin1_General_CP1_CI_AS NOT NULL,
5 ) ON [PRIMARY]
6
7
```

Additional Features

Working with existing .sql files

You can use project “Carbon” to work with your existing .sql files. Most customers organize files in a folder structure. You can open a folder in project “Carbon” to easily access all the files and sub-directories within it.


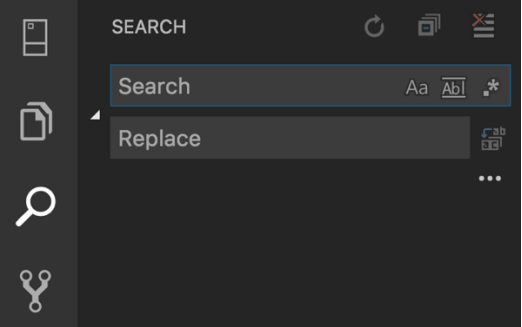
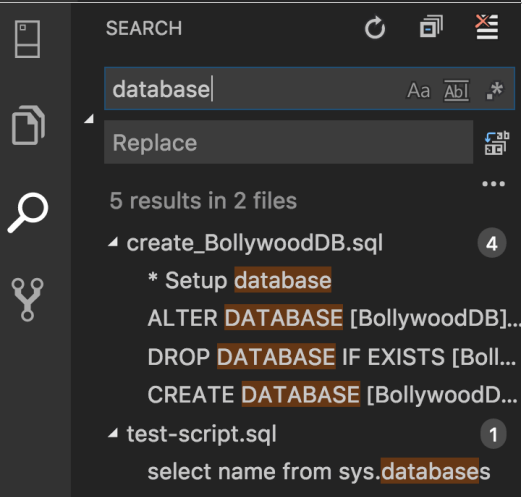
After you open a folder in project “Carbon”, you can also use additional features such as search in files and source control integration.

<div>1. Click the  icon in the Activity Bar to show the Explorer in the side bar.</div> <div>2. Project “Carbon” displays the Open Folder button if you do not have a folder open.</div> <div>3. Click Open Folder to browse to a folder on your computer and open it in project “Carbon”</div>	 <p>The screenshot shows the Explorer sidebar in Visual Studio Code. The 'EXPLORER' view is active, and it displays 'OPEN EDITORS' and 'NO FOLDER OPENED'. A message states 'You have not yet opened a folder.' with a blue 'Open Folder' button below it.</p>	
<div>4. In this example, we have opened the folder MY-SQL-FILES which has 3 .sql files in it.</div>	 <p>The screenshot shows the Explorer sidebar with the 'MY-SQL-FILES' folder expanded. It lists three files: 'create_BollywoodDB.sql', 'sql_security_demo_BollywoodDB.sql', and 'test-script.sql'.</p>	
<div>5. Click on a file in the Explorer to open it in a query editor window. In this example, we have opened the file test-script.sql</div> <div>6. Click the Connect button in the query editor window to show the connection fly out and connect to a server.</div> <div>7. Click the Run button or press F5 to execute the T-SQL statements in the file.</div>	 <p>The screenshot shows the query editor window with the 'test-script.sql' file open. The Explorer sidebar is visible on the left, showing the file is selected. The query editor has a toolbar with 'Run', 'Cancel', 'Connect', and 'Change Connection' buttons. The SQL code 'select name from sys.databases' is visible in the editor.</p>	

Project “Carbon” Private Preview

Use Search with your files

After you open a folder in project “Carbon”, you can perform global search and replace across your open folder

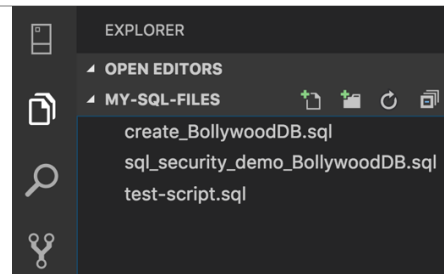

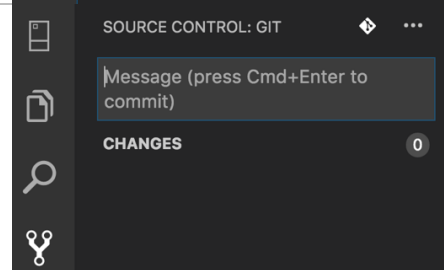


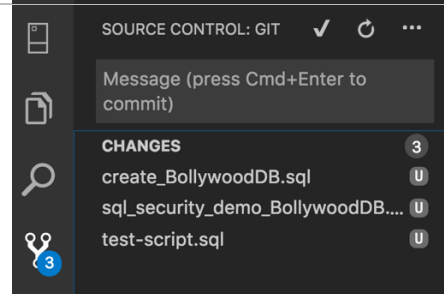
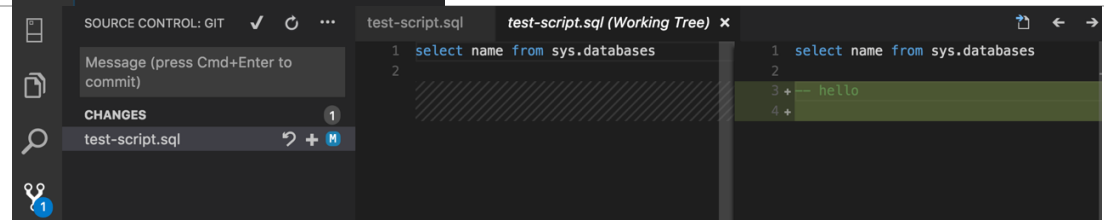
<p>1. Click the  icon in the Activity Bar to show Search in the side bar.</p>	
<p>2. In this example, we searched for the text database in all files in the folder MY-SQL-FILES.</p> <p>3. The Search experience in the side bar shows all occurrences of the text database in all files in the folder MY-SQL-FILES.</p> <p>4. From here, you can open the file with the matching text or easily replace all occurrences in all files with other text.</p>	

Use Source Control (Git)

Project “Carbon” has built-in support for source code control using Git but requires Git to be installed separately. Please download and install Git for your platform as described here: <https://git-scm.com/download>

After you open a folder in project “Carbon”, you can use the built-in source control integration with Git.

Project “Carbon” Private Preview

<div>1. In this example, we have opened the folder MY-SQL-FILES which has 3 .sql files in it</div> <div>2. This folder is currently not under source control.</div>		
<div>3. Click the  icon in the Activity Bar to show Source Control in the side bar.</div> <div>4. Currently, project “Carbon” only supports “Git” and we plan to add other SCM providers in future releases.</div>		
<div>5. Click the  icon to initialize the local Git repository.</div> <div>6. Enter a message and click the  icon to commit to the local repo.</div>		
<div>7. From here, when you change a file in your folder, you can use Git to see diffs, merge and check-in</div>		

Use the Interactive Terminal

In project “Carbon”, you can open an integrated terminal, initially starting at the root of your folder. This can be very convenient as you don't have to switch windows or alter the state of an existing terminal to perform quick command line tasks.

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<ol style="list-style-type: none">1. From the View menu, click Integrated Terminal to show the terminal.2. From here, you can run any command line tool or shell script for your platform.3. This example shows the sqlcmd command line utility running in the Integrated Terminal in project “Carbon” on macOS.	
<ol style="list-style-type: none">4. This example shows the Invoke-Sqlcmd PowerShell cmdlet running in the Integrated Terminal in project “Carbon: on Windows.	

Use the Command Palette

Every command in project “Carbon” has a customizable keyboard shortcut and is accessible through the **Command Palette**. The **Command Palette** provides an easy way to access and execute editor commands, open files, search, execute queries, perform SCC operations, etc.

Press the **F1** key to display the Command Palette and type **?** into the input field to get a list of available commands you can execute.

Feature backlog

The primary purpose of this private preview is to offer customers under NDA a sneak peek of project “Carbon” and seek feedback. We have a sizable backlog of features planned for upcoming releases. In no particular order, here’s a high-level list of items we’re working on next:

Generate T-SQL scripts Backup & Restore View query plans	Configure, Manage, Monitor and Troubleshoot Always On availability groups Support for Registered Servers and Central Management Servers	Support for PostgreSQL
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