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07
Apr

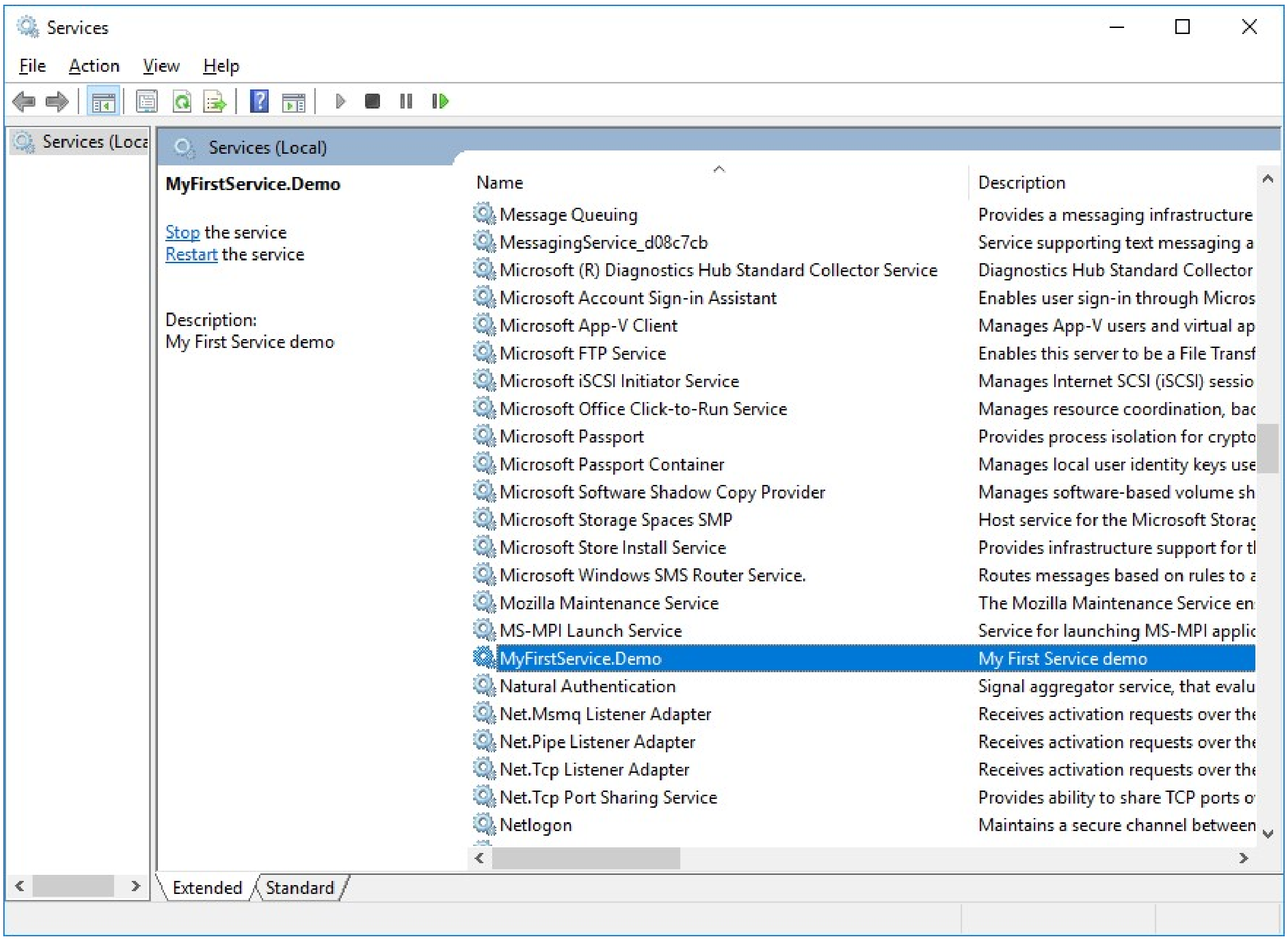
Understanding how to create and Install Windows Services in C#.Net

Jayatirth Kulkarni | Windows Service , C# | 0 Comments | Return

Windows Service in C#:

This article is about how to create a Windows Service in C# .net using Visual Studio.

Windows Services:
Windows services are the executable applications which run in the background and doesn't contain any user interface. Windows services can be scheduled to run automatically whenever operating system boots or can be started/stopped/paused manually from the services window.



MyFirstService.Demo

Stop the service
Restart the service

Description:
My First Service demo

Name	Description
Message Queuing	Provides a messaging infrastructure
MessagingService_d08c7cb	Service supporting text messaging a
Microsoft (R) Diagnostics Hub Standard Collector Service	Diagnostics Hub Standard Collector
Microsoft Account Sign-in Assistant	Enables user sign-in through Micros
Microsoft App-V Client	Manages App-V users and virtual ap
Microsoft FTP Service	Enables this server to be a File Transf
Microsoft iSCSI Initiator Service	Manages Internet SCSI (iSCSI) sessio
Microsoft Office Click-to-Run Service	Manages resource coordination, bac
Microsoft Passport	Provides process isolation for crypto
Microsoft Passport Container	Manages local user identity keys use
Microsoft Software Shadow Copy Provider	Manages software-based volume sh
Microsoft Storage Spaces SMP	Host service for the Microsoft Storag
Microsoft Store Install Service	Provides infrastructure support for tl
Microsoft Windows SMS Router Service.	Routes messages based on rules to a
Mozilla Maintenance Service	The Mozilla Maintenance Service en
MS-MPI Launch Service	Service for launching MS-MPI applic
MyFirstService.Demo	My First Service demo
Natural Authentication	Signal aggregator service, that evalu
Net.Msmq Listener Adapter	Receives activation requests over the
Net.Pipe Listener Adapter	Receives activation requests over the
Net.Tcp Listener Adapter	Receives activation requests over the
Net.Tcp Port Sharing Service	Provides ability to share TCP ports o
Netlogon	Maintains a secure channel between

Above Services window can be opened in following ways:

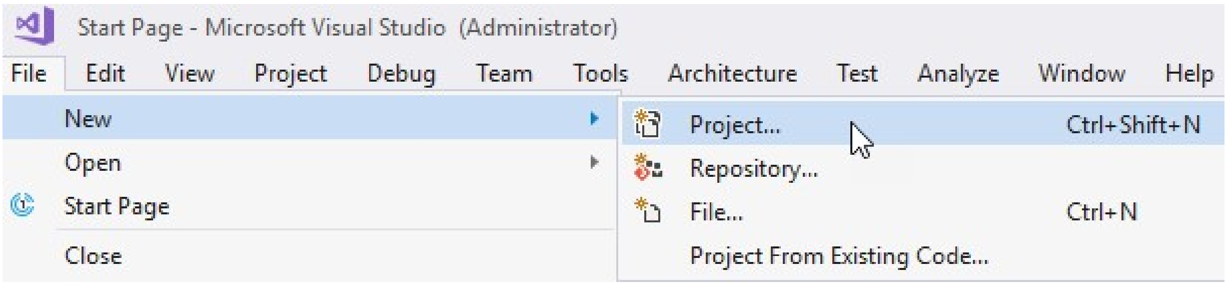
a. Open Run window (Window + R) and type services.msc and press Enter.
b. Control Panel > Administrative Tools > Services
c. Type services in search option (Win 10 OS).

Scenarios where Windows Services are used:

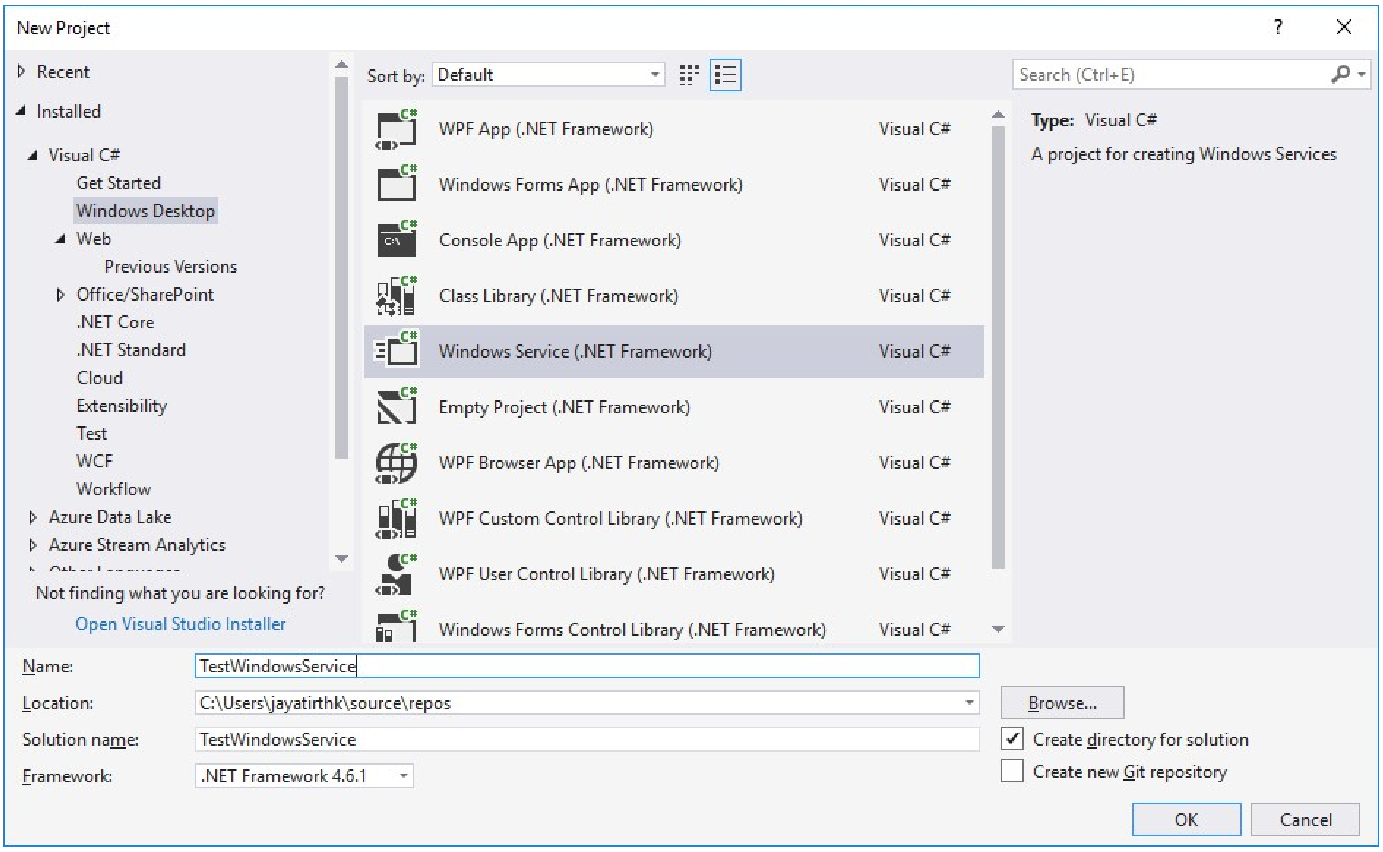
If there is a requirement where certain task to be done on certain time intervals without user intervention. Consider sending email to the customers, processing some files whenever files are copied to the folder etc.

Step by step process of creating Windows Service:

1. Open Visual Studio, File > New > Project



2. Under Visual C# Select, Windows Desktop > Windows Service and give an appropriate name, file location to store project and then click OK



Sort by: Default

WPF App (.NET Framework)	Visual C#
Windows Forms App (.NET Framework)	Visual C#
Console App (.NET Framework)	Visual C#
Class Library (.NET Framework)	Visual C#
Windows Service (.NET Framework)	Visual C#
Empty Project (.NET Framework)	Visual C#
WPF Browser App (.NET Framework)	Visual C#
WPF Custom Control Library (.NET Framework)	Visual C#
WPF User Control Library (.NET Framework)	Visual C#
Windows Forms Control Library (.NET Framework)	Visual C#

Type: Visual C#

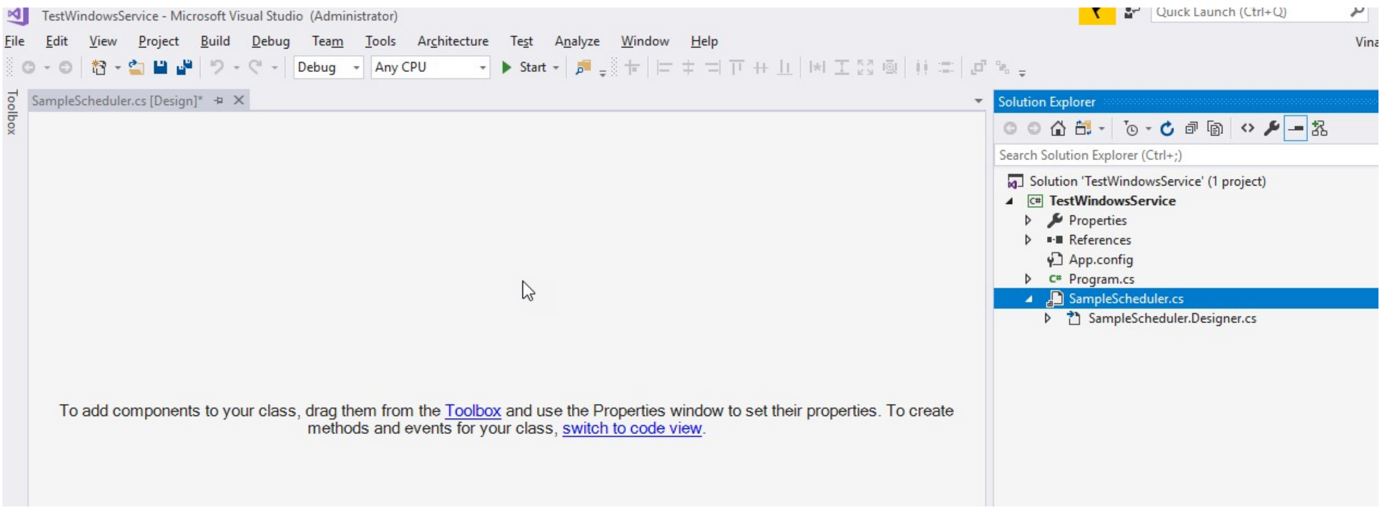
A project for creating Windows Services

Name:	TestWindowsService
Location:	C:\Users\jayatirthk\source\repos
Solution name:	TestWindowsService
Framework:	.NET Framework 4.6.1

[✓] Create directory for solution

[ ] Create new Git repository

Click on OK button, the below design screen will appear, which is the service. If you want to rename the Service1.cs with any other name, then right click on the file in the solution explorer > Rename. In the following screen changed name to SampleScheduler.cs



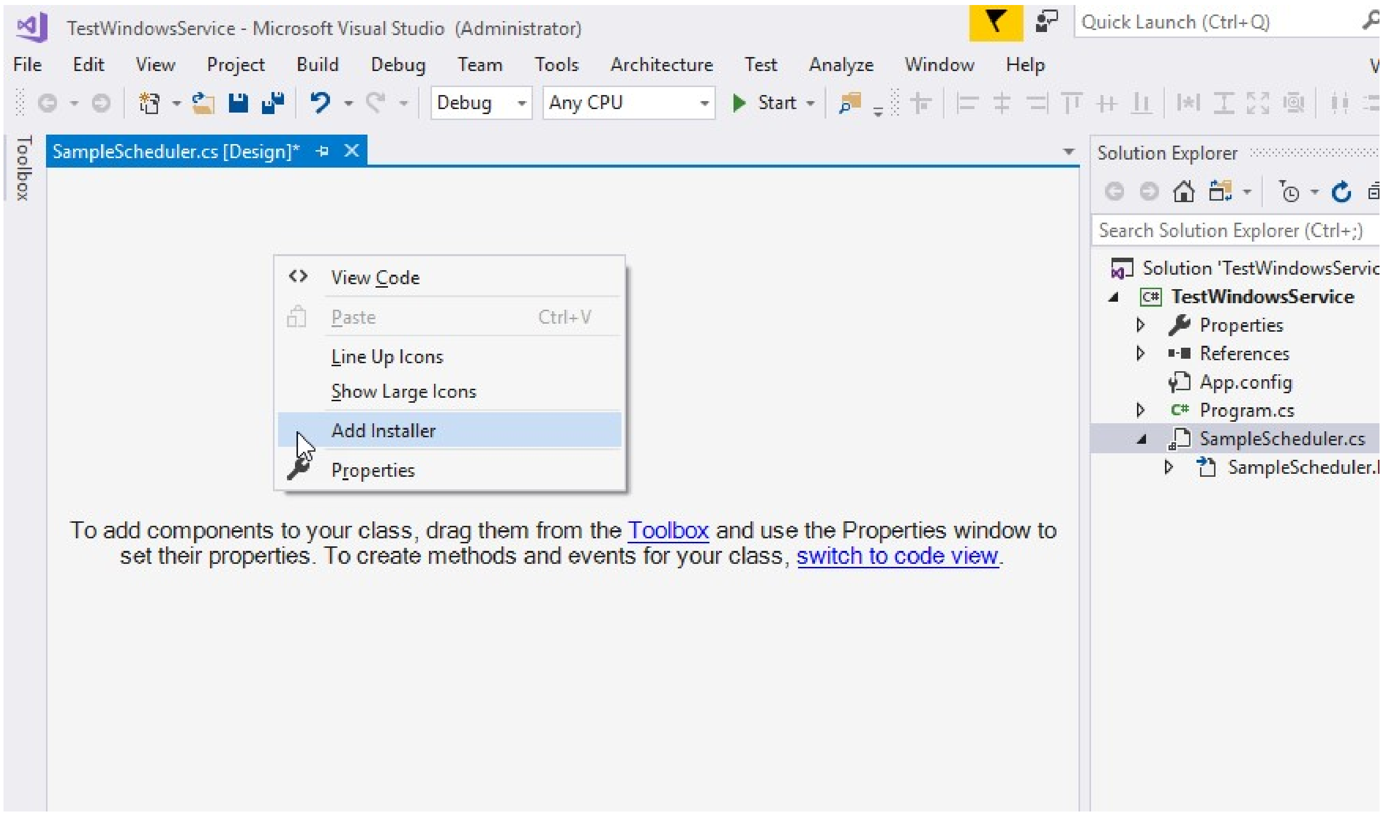
Solution 'TestWindowsService' (1 project)
- TestWindowsService
  - Properties
  - References
  - App.config
  - Program.cs
  - SampleScheduler.cs
    - SampleScheduler.Designer.cs

To add components to your class, drag them from the Toolbox and use the Properties window to set their properties. To create methods and events for your class, switch to code view.

3. Adding Installer to Windows Service:

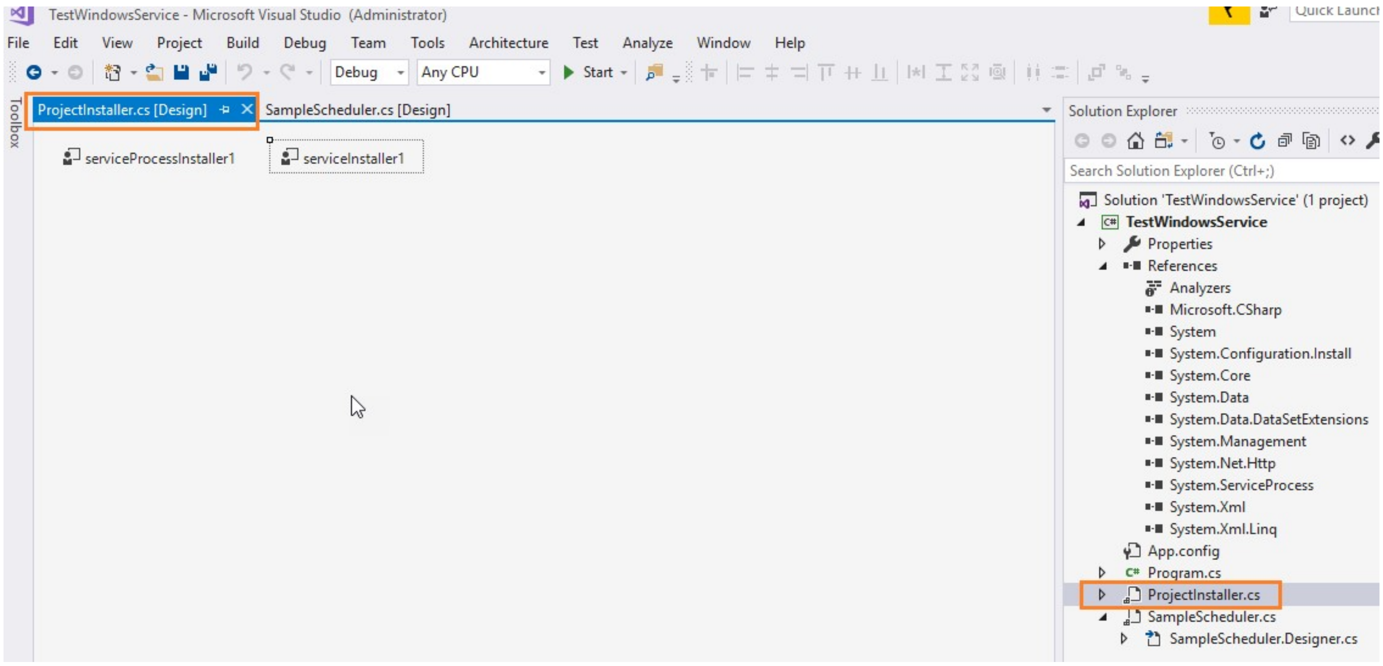
To run the Windows Service, you need to install the Windows Service application, which registers it with the Services in Control Manager.

Right Click> Add Installer

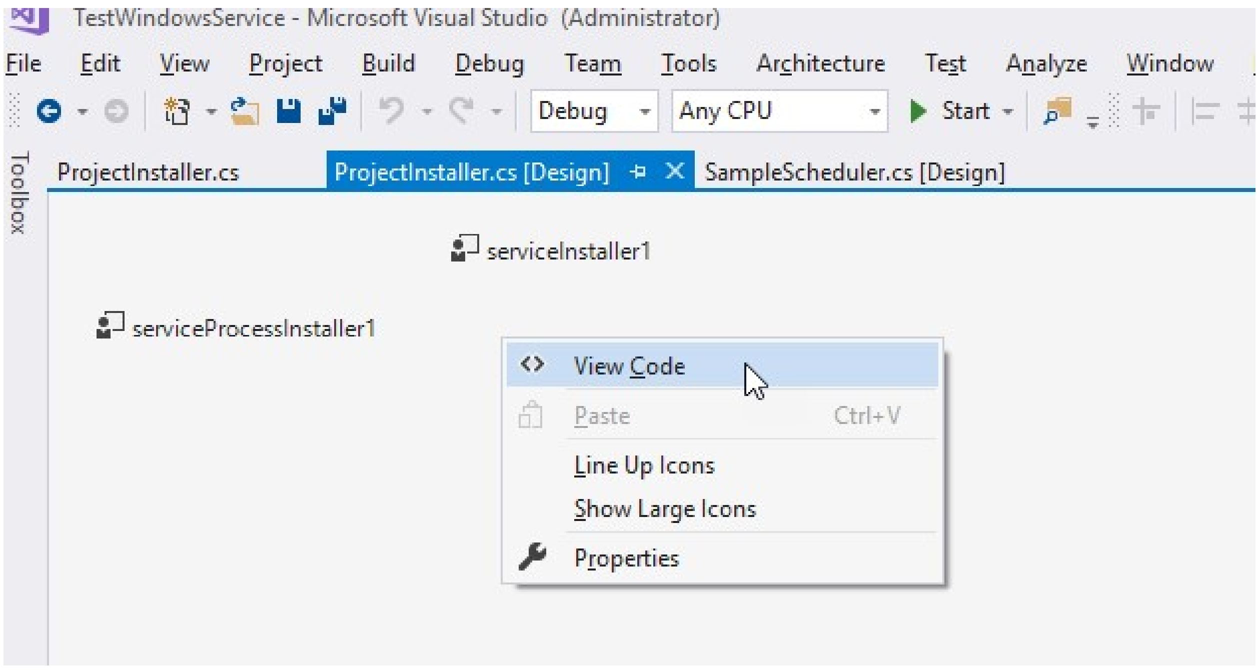

TestWindowsService - Microsoft Visual Studio (Administrator)
Quick Launch (Ctrl+Q)
File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help
Debug
Any CPU
Start
Toolbox
SampleScheduler.cs [Design]*
View Code
Paste Ctrl+V
Line Up Icons
Show Large Icons
Add Installer
Properties
Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution 'TestWindowsServic
TestWindowsService
Properties
References
App.config
Program.cs
SampleScheduler.cs
SampleScheduler.I

To add components to your class, drag them from the Toolbox and use the Properties window to set their properties. To create methods and events for your class, switch to code view.

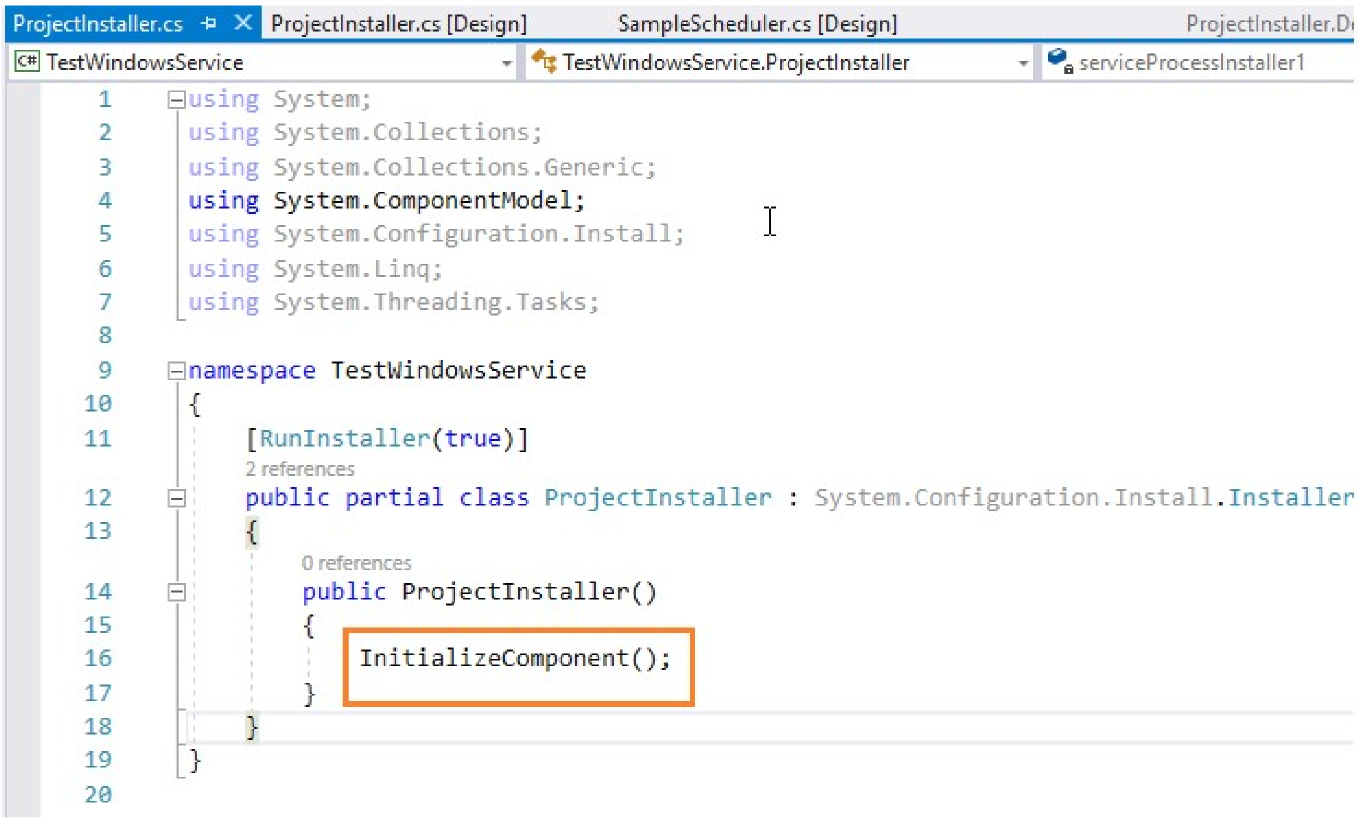
After Adding Installer, ProjectInstaller will be added in your project and ProjectInstaller.cs file will be opened by default. Then save all the files.


TestWindowsService - Microsoft Visual Studio (Administrator)
Quick Launch
File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help
Debug
Any CPU
Start
Toolbox
ProjectInstaller.cs [Design]
SampleScheduler.cs [Design]
serviceProcessInstaller1
serviceInstaller1
Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution 'TestWindowsService' (1 project)
TestWindowsService
Properties
References
Analyzers
Microsoft.CSharp
System
System.Configuration.Install
System.Core
System.Data
System.Data.DataSetExtensions
System.Management
System.Net.Http
System.ServiceProcess
System.Xml
System.Xml.Linq
App.config
Program.cs
ProjectInstaller.cs
SampleScheduler.cs
SampleScheduler.Designer.cs

4. Right-click on the blank area under ProjectInstaller.cs and select View Code:


TestWindowsService - Microsoft Visual Studio (Administrator)
File Edit View Project Build Debug Team Tools Architecture Test Analyze Window
Debug Any CPU Start
Toolbox
ProjectInstaller.cs ProjectInstaller.cs [Design] SampleScheduler.cs [Design]
serviceInstaller1
serviceProcessInstaller1
View Code
Paste Ctrl+V
Line Up Icons
Show Large Icons
Properties

It Contains Constructor which has InitializeComponent method. This method contains the logic which creates and initializes the user interface objects dragged on the design surface and properties window will be provided for form window.


ProjectInstaller.cs ProjectInstaller.cs [Design] SampleScheduler.cs [Design] ProjectInstaller.D
TestWindowsService TestWindowsService.ProjectInstaller serviceProcessInstaller1

```
using System;
using System.Collections;
using System.Collections.Generic;
using System.ComponentModel;
using System.Configuration.Install;
using System.Linq;
using System.Threading.Tasks;

namespace TestWindowsService
{
    [RunInstaller(true)]
    2 references
    public partial class ProjectInstaller : System.Configuration.Install.Installer
    {
        0 references
        public ProjectInstaller()
        {
            InitializeComponent();
        }
    }
}
```

It's important you should not call any method before the call of InitializeComponent method.

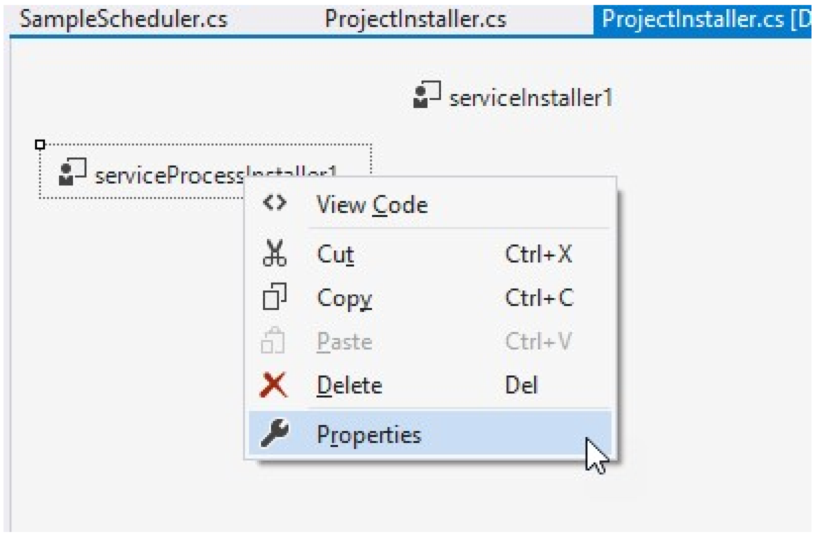
5. Go to the definition by pressing F12 Key on InitializeComponent method.

Add the below line:

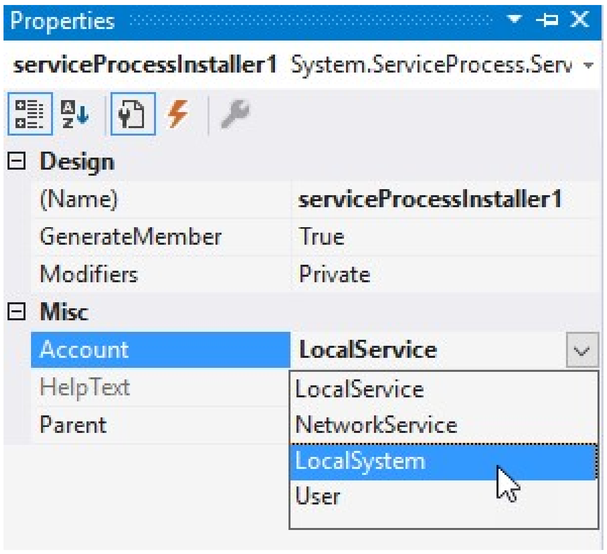
this.serviceProcessInstaller1.Account = System.ServiceProcess.ServiceAccount.LocalSystem;

Or the setting can also be changed in design as:

Right click on serviceProcessInstaller1 > Properties



Account > Select LocalSystem



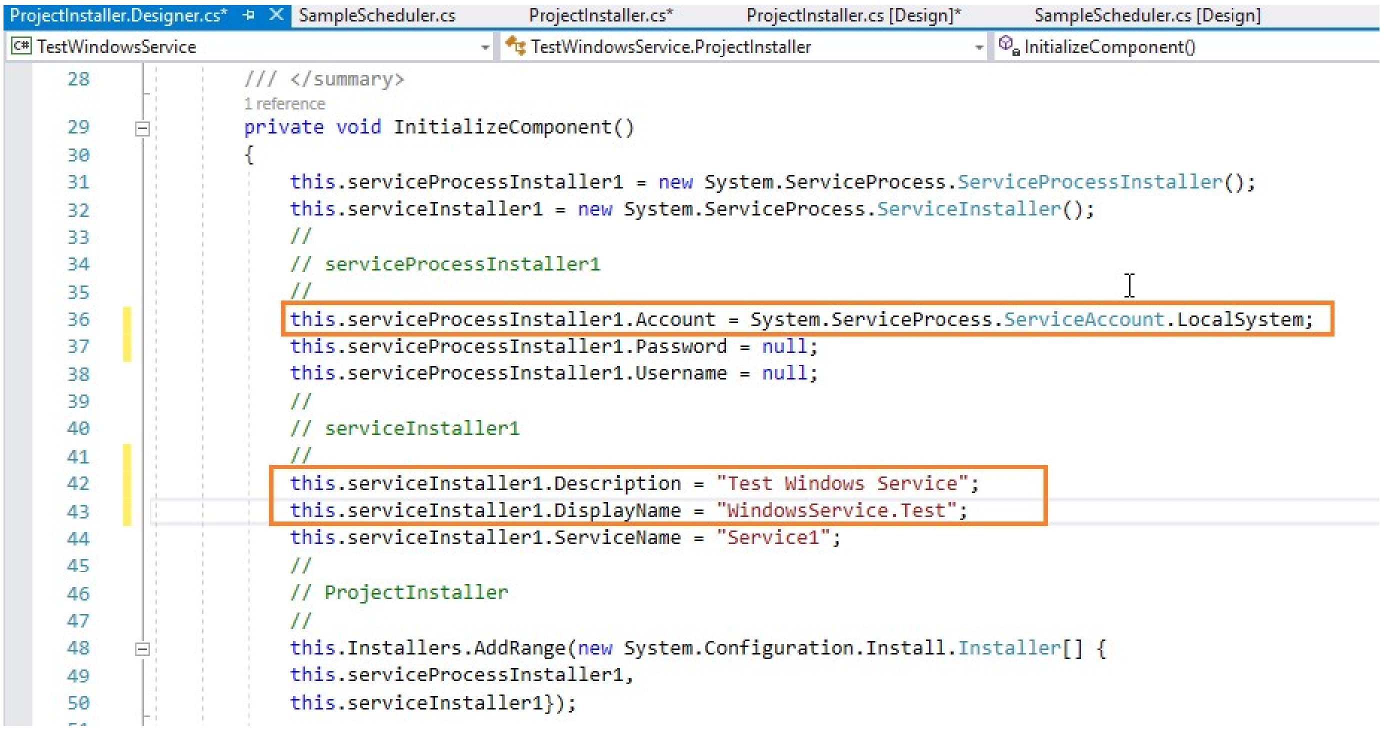
(Name)	serviceProcessInstaller1
GenerateMember	True
Modifiers	Private
Account	LocalService
HelpText	
Parent	

You can also provide optional description and display service name by adding following lines of code:

this.serviceInstaller1.Description = "Test Windows Service";

this.serviceInstaller1.DisplayName = "WindowsService.Test";

this.serviceInstaller1.DisplayName will displays the name under services window.

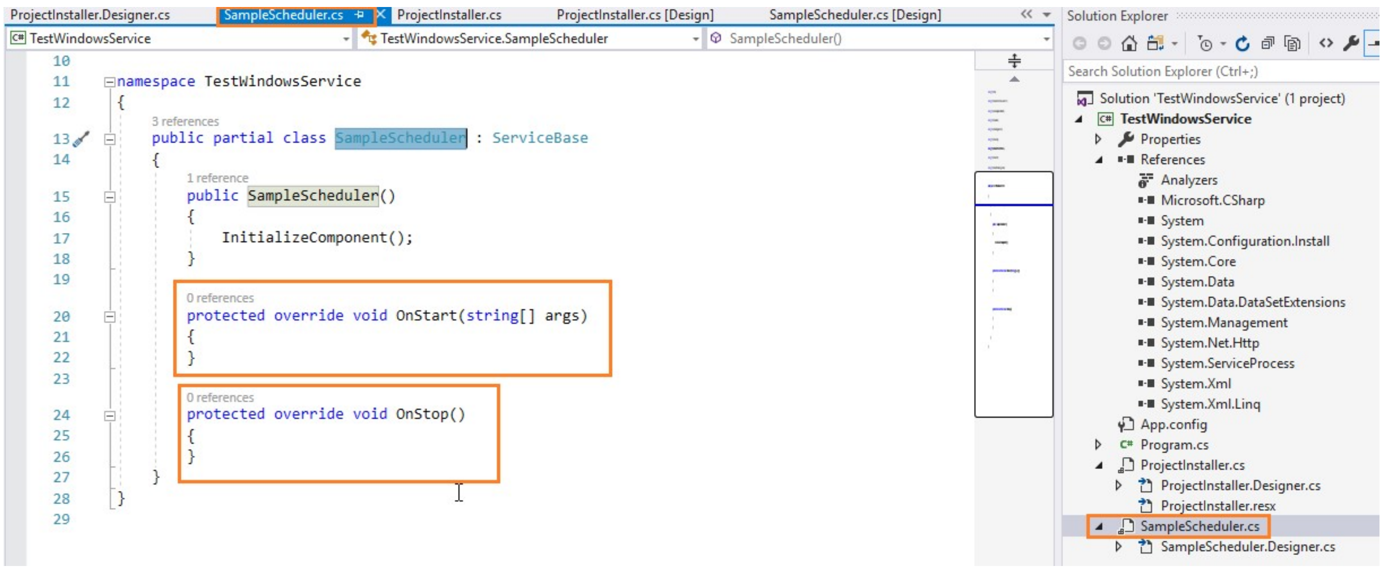


ProjectInstaller.Designer.cs* | SampleScheduler.cs | ProjectInstaller.cs* | ProjectInstaller.cs [Design]* | SampleScheduler.cs [Design]

TestWindowsService | TestWindowsService.ProjectInstaller | InitializeComponent()

```
        /// </summary>
        private void InitializeComponent()
        {
            this.serviceProcessInstaller1 = new System.ServiceProcess.ServiceProcessInstaller();
            this.serviceInstaller1 = new System.ServiceProcess.ServiceInstaller();
            //
            // serviceProcessInstaller1
            //
            this.serviceProcessInstaller1.Account = System.ServiceProcess.ServiceAccount.LocalSystem;
            this.serviceProcessInstaller1.Password = null;
            this.serviceProcessInstaller1.Username = null;
            //
            // serviceInstaller1
            //
            this.serviceInstaller1.Description = "Test Windows Service";
            this.serviceInstaller1.DisplayName = "WindowsService.Test";
            this.serviceInstaller1.ServiceName = "Service1";
            //
            // ProjectInstaller
            //
            this.Installers.AddRange(new System.Configuration.Install.Installer[] {
            this.serviceProcessInstaller1,
            this.serviceInstaller1});
```

6. In this step we will write code to create timer and text file and write current time in text file using the service in some time intervals. Code will be written in the created in SampleScheduler.cs.



ProjectInstaller.Designer.cs | SampleScheduler.cs | ProjectInstaller.cs | ProjectInstaller.cs [Design] | SampleScheduler.cs [Design]

TestWindowsService | TestWindowsService.SampleScheduler | SampleScheduler()

```

namespace TestWindowsService
{
    public partial class SampleScheduler : ServiceBase
    {
        public SampleScheduler()
        {
            InitializeComponent();
        }

        protected override void OnStart(string[] args)
        {
        }

        protected override void OnStop()
        {
        }
    }
}
```

In the above screenshot, you can see two methods called OnStart() and OnStop().

The OnStart() triggers when the Windows Service starts and the OnStop() triggers when the service stops.

The following code must be written in SampleScheduler.cs file.

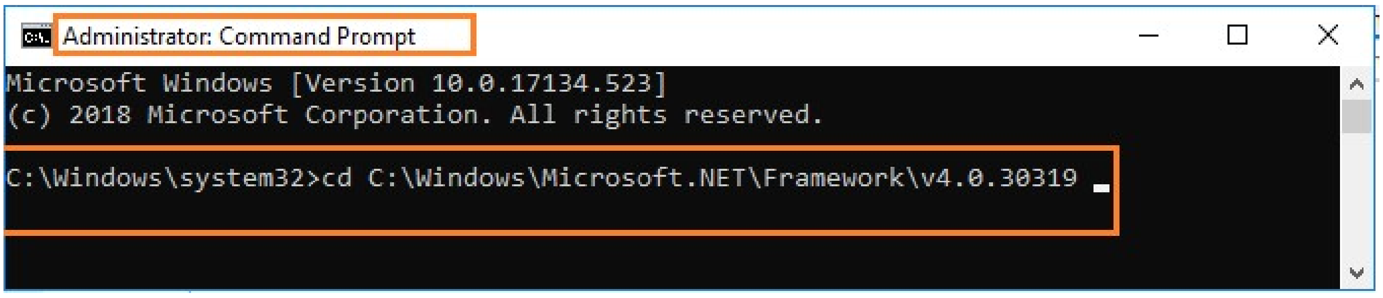
```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
usin System.Diagnostics;
using System.ServiceProcess;
using System.Text;
using System.Threading.Tasks;
using System.Timers;
using System.IO;

namespace TestWindowsService
{
    public partial class SampleScheduler : ServiceBase
    {
        Timer timer = new Timer();
        public SampleScheduler()
        {
            InitializeComponent();
        }

        protected override void OnStart(string[] args)
        {
            WriteTextToFile("Service started at " + DateTime.Now);
            timer.Elapsed += new ElapsedEventHandler(OnElapsedTime);
            timer.Interval = 10000; //time interval in milliseconds (10Sec)
            timer.Enabled = true;
        }

        protected override void OnStop()
        {
            WriteTextToFile("Service stopped at " + DateTime.Now);
        }

        private void OnElapsedTime(object source, ElapsedEventArgs e)
        {
            WriteTextToFile("Service recalled at " + DateTime.Now);
        }

        public void WriteTextToFile(string Message)
        {
            string checkPath = AppDomain.CurrentDomain.BaseDirectory + "\\LogsFile";
            if (!Directory.Exists(checkPath))
            {
                Directory.CreateDirectory(checkPath);
            }
            string filepath = AppDomain.CurrentDomain.BaseDirectory + "\\LogsFile\\Servic
eLog_" + DateTime.Now.Date.ToShortDateString().Replace('/', '_') + ".txt";
            if (!File.Exists(filepath))
            {
                // Create a file to write to.
                using (StreamWriter sw = File.CreateText(filepath))
                {
                    sw.WriteLine(Message);
                }
            }
            else
            {
                using (StreamWriter sw = File.AppendText(filepath))
                {
                    sw.WriteLine(Message);
                }

            }
        }
    }
}
```

Above code will create a text file if it doesn't exists, calls service every 10 seconds and logs into text file.

7. Installing Windows Service:

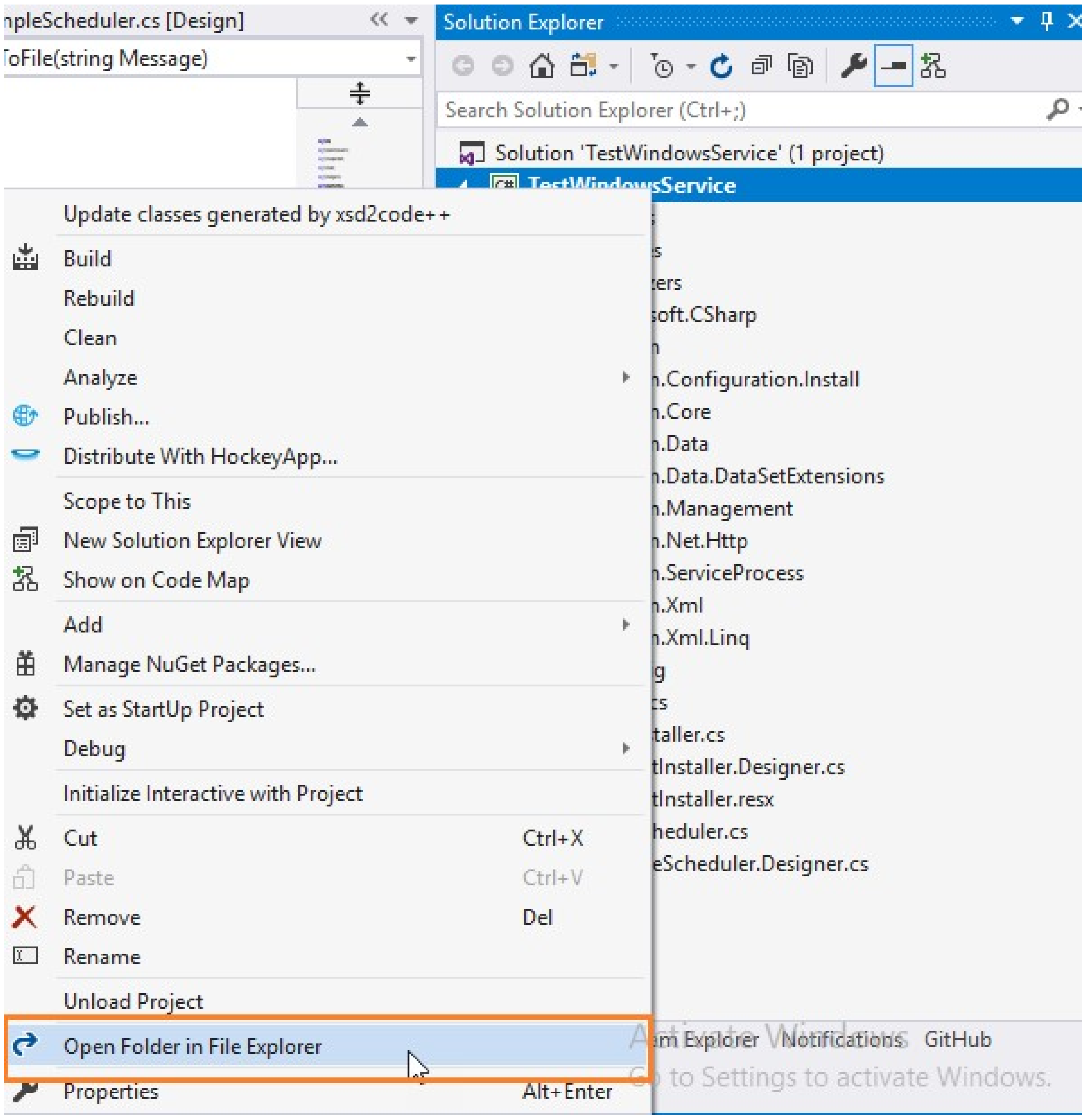
a. Rebuild the project.
b. Open command prompt (cmd) in Administrator mode.
c. Write the below command in command prompt and press Enter.

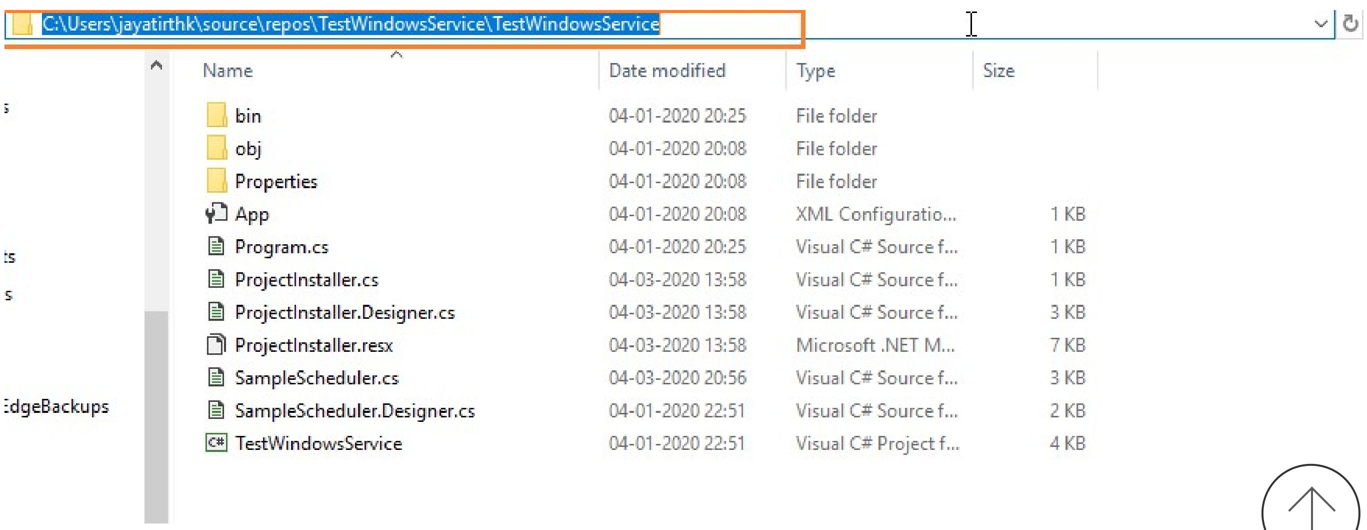
cd C:\Windows\Microsoft.NET\Framework\v4.0.30319



```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17134.523]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Windows\system32>cd C:\Windows\Microsoft.NET\Framework\v4.0.30319
```

d. Copy the full path of your Windows Service exe file: go to the project folder as shown in below screenshot.




C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService

Name	Date modified	Type	Size
bin	04-01-2020 20:25	File folder	
obj	04-01-2020 20:08	File folder	
Properties	04-01-2020 20:08	File folder	
App	04-01-2020 20:08	XML Configuratio...	1 KB
Program.cs	04-01-2020 20:25	Visual C# Source f...	1 KB
ProjectInstaller.cs	04-03-2020 13:58	Visual C# Source f...	1 KB
ProjectInstaller.Designer.cs	04-03-2020 13:58	Visual C# Source f...	3 KB
ProjectInstaller.resx	04-03-2020 13:58	Microsoft .NET M...	7 KB
SampleScheduler.cs	04-03-2020 20:56	Visual C# Source f...	3 KB
SampleScheduler.Designer.cs	04-01-2020 22:51	Visual C# Source f...	2 KB
TestWindowsService	04-01-2020 22:51	Visual C# Project f...	4 KB

As shown in above screen shot, that folder location is where the project file is located go to bin> debug then copy the file with the extension .exe. In this case it is “TestWindowsService.exe”.

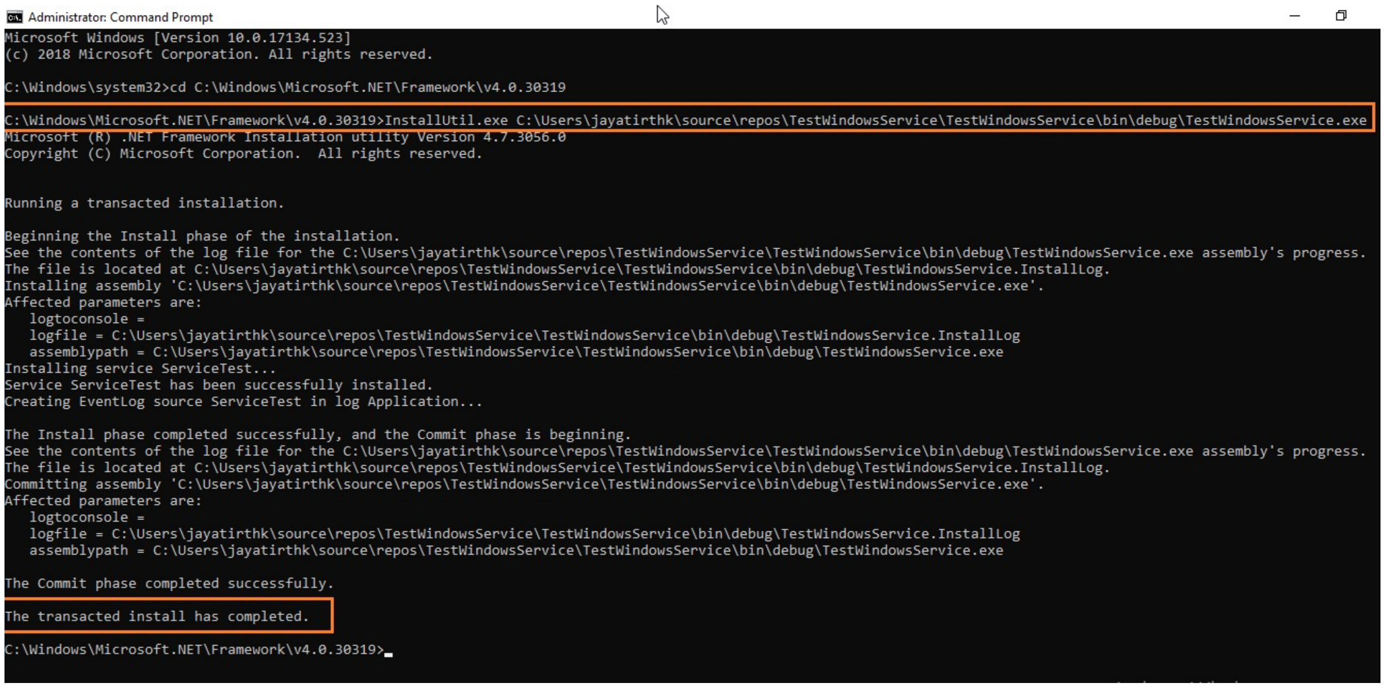
Our final path will be C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\Debug in that path include “TestWindowsService.exe”.

Then add installUtil.exe before the project path while executing in command prompt (same amd which was opened earlier) as shown below.

InstallUtil.exe + your project file path +bin\debug+\yourservicename.exe

Final path:

C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\debug\TestWindowsService.exe



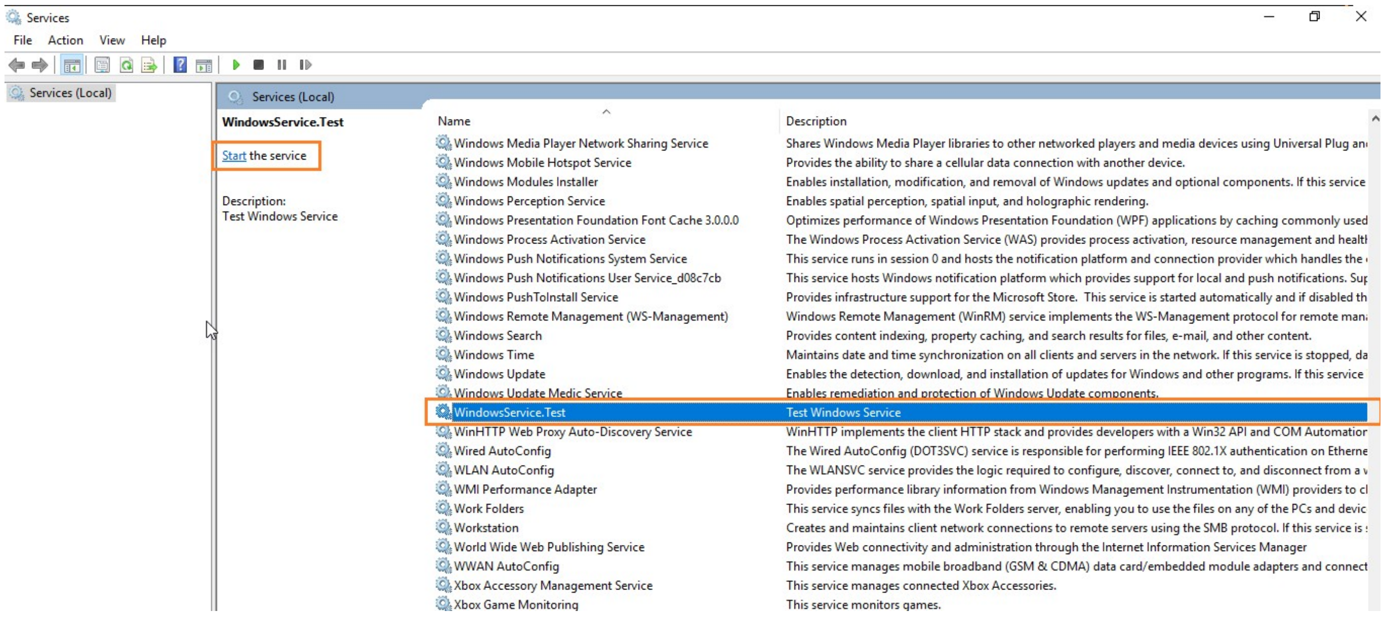
```
Microsoft Windows [Version 10.0.17134.523]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Windows\system32>cd C:\Windows\Microsoft.NET\Framework\v4.0.30319

C:\Windows\Microsoft.NET\Framework\v4.0.30319>InstallUtil.exe C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\debug\TestWindowsService.exe
Microsoft (R) .NET Framework Installation utility Version 4.7.3056.0
Copyright (C) Microsoft Corporation.  All rights reserved.


Running a transacted installation.

Beginning the Install phase of the installation.
See the contents of the log file for the C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\debug\TestWindowsService.exe assembly's progress.
The file is located at C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\debug\TestWindowsService.InstallLog.
Installing assembly 'C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\debug\TestWindowsService.exe'.
Affected parameters are:
   logtoconsole =
   logfile = C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\debug\TestWindowsService.InstallLog
   assemblypath = C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\debug\TestWindowsService.exe
Installing service ServiceTest...
Service ServiceTest has been successfully installed.
Creating EventLog source ServiceTest in log Application...

The Install phase completed successfully, and the Commit phase is beginning.
See the contents of the log file for the C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\debug\TestWindowsService.exe assembly's progress.
The file is located at C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\debug\TestWindowsService.InstallLog.
Committing assembly 'C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\debug\TestWindowsService.exe'.
Affected parameters are:
   logtoconsole =
   logfile = C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\debug\TestWindowsService.InstallLog
   assemblypath = C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\debug\TestWindowsService.exe

The Commit phase completed successfully.

The transacted install has completed.

C:\Windows\Microsoft.NET\Framework\v4.0.30319>
```

In the above step the installation of the Windows Service has been completed.

To open the installed service, follow the steps below:

As explained earlier, above Services window can be opened in following ways:

a. Open Run window (Window + R) and type services.msc and press Enter.
b. Control Panel > Administrative Tools > Services
c. Type services in search option (Win 10 OS).



Services

File Action View Help

Services (Local)

Services (Local)

WindowsService.Test

Start the service

Description:
Test Windows Service

Name	Description
Windows Media Player Network Sharing Service	Shares Windows Media Player libraries to other networked players and media devices using Universal Plug an
Windows Mobile Hotspot Service	Provides the ability to share a cellular data connection with another device.
Windows Modules Installer	Enables installation, modification, and removal of Windows updates and optional components. If this service
Windows Perception Service	Enables spatial perception, spatial input, and holographic rendering.
Windows Presentation Foundation Font Cache 3.0.0.0	Optimizes performance of Windows Presentation Foundation (WPF) applications by caching commonly used
Windows Process Activation Service	The Windows Process Activation Service (WAS) provides process activation, resource management and healt
Windows Push Notifications System Service	This service runs in session 0 and hosts the notification platform and connection provider which handles the
Windows Push Notifications User Service_d08c7cb	This service hosts Windows notification platform which provides support for local and push notifications. Sup
Windows PushToInstall Service	Provides infrastructure support for the Microsoft Store. This service is started automatically and if disabled th
Windows Remote Management (WS-Management)	Windows Remote Management (WinRM) service implements the WS-Management protocol for remote man
Windows Search	Provides content indexing, property caching, and search results for files, e-mail, and other content.
Windows Time	Maintains date and time synchronization on all clients and servers in the network. If this service is stopped, da
Windows Update	Enables the detection, download, and installation of updates for Windows and other programs. If this service
Windows Update Medic Service	Enables remediation and protection of Windows Update components.
WindowsService.Test	Test Windows Service
WinHTTP Web Proxy Auto-Discovery Service	WinHTTP implements the client HTTP stack and provides developers with a Win32 API and COM Automatior
Wired AutoConfig	The Wired AutoConfig (DOT3SVC) service is responsible for performing IEEE 802.1X authentication on Etherne
WLAN AutoConfig	The WLANSVC service provides the logic required to configure, discover, connect to, and disconnect from a v
WMI Performance Adapter	Provides performance library information from Windows Management Instrumentation (WMI) providers to cl
Work Folders	This service syncs files with the Work Folders server, enabling you to use the files on any of the PCs and devic
Workstation	Creates and maintains client network connections to remote servers using the SMB protocol. If this service is
World Wide Web Publishing Service	Provides Web connectivity and administration through the Internet Information Services Manager
WWAN AutoConfig	This service manages mobile broadband (GSM & CDMA) data card/embedded module adapters and connect
Xbox Accessory Management Service	This service manages connected Xbox Accessories.
Xbox Game Monitoring	This service monitors games.

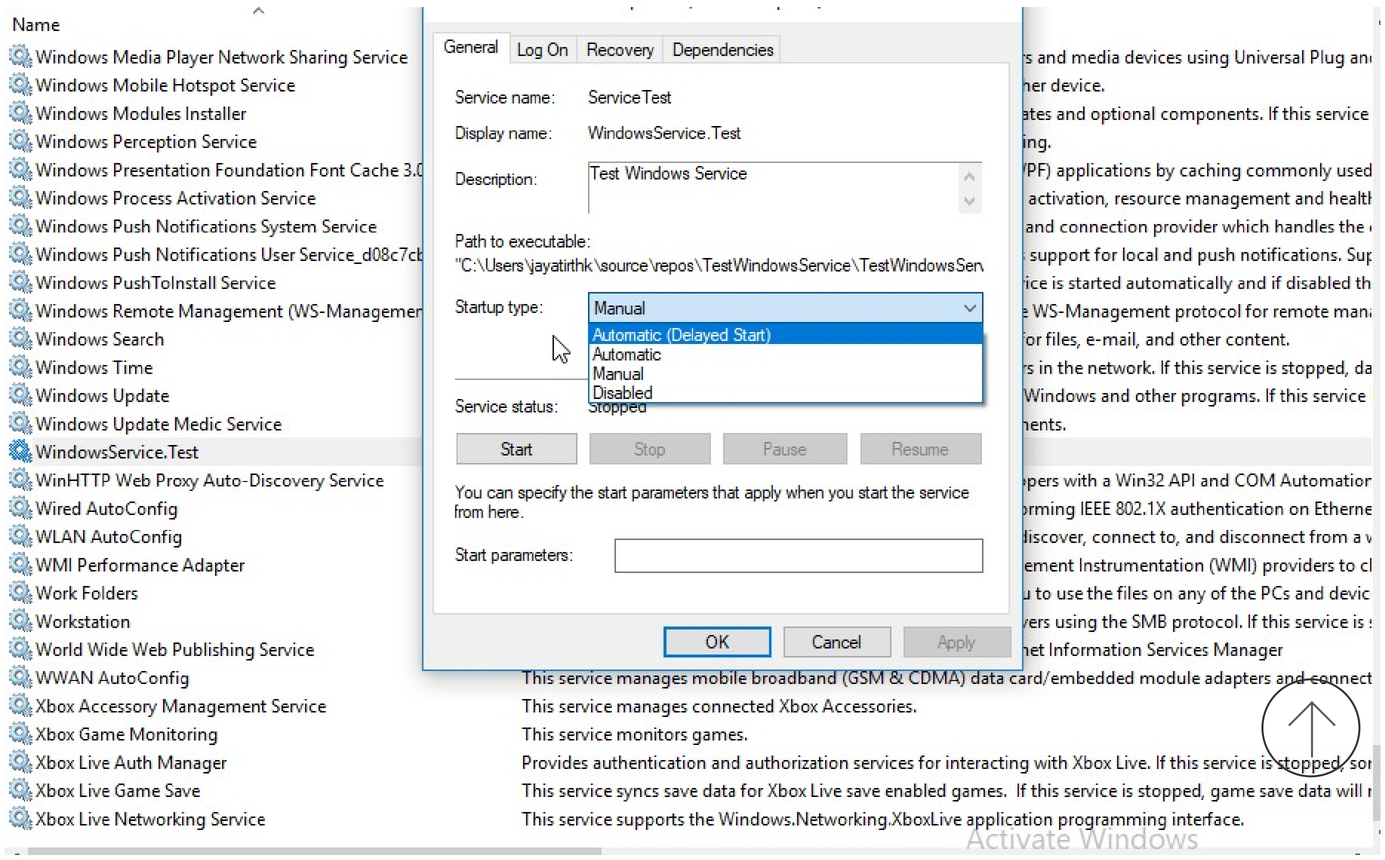
Our Service can seen in the above image.

To start the service:

a. Click on service as indicated in the above screen shot.
b. Right click on the service > Start.

You can schedule the service to start automatically by:

right click on service > properties > new window will pop up > Select start up type as Automatic > Click on start. As shown below screen shot



General | Log On | Recovery | Dependencies

Service name: ServiceTest

Display name: WindowsService.Test

Description: Test Windows Service

Path to executable:
"C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsSen

Startup type: Manual

Automatic (Delayed Start)
Automatic
Manual
Disabled

Service status: Stopped

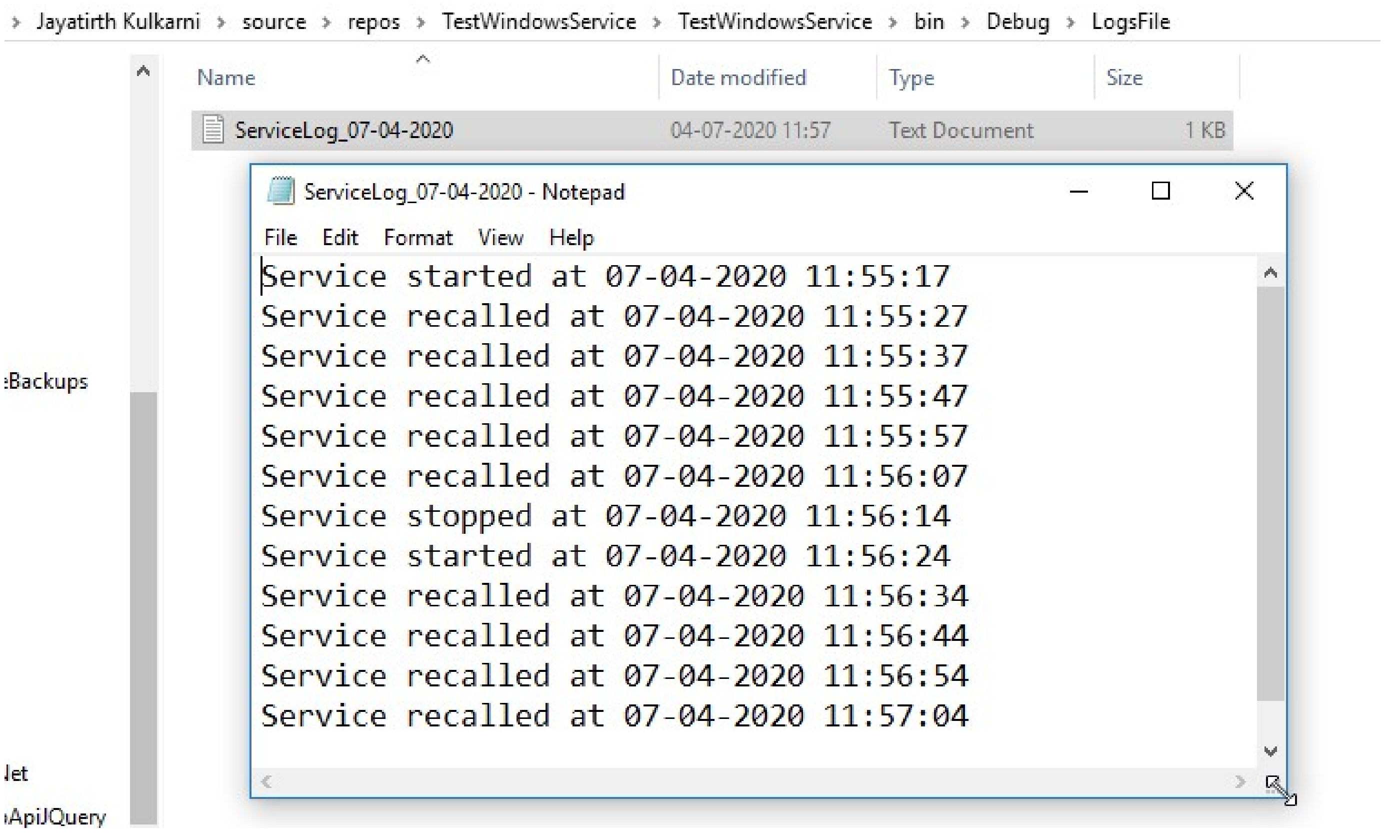
Start | Stop | Pause | Resume

You can specify the start parameters that apply when you start the service from here.

Start parameters:

OK | Cancel | Apply

Name	
Windows Media Player Network Sharing Service	s and media devices using Universal Plug an
Windows Mobile Hotspot Service	er device.
Windows Modules Installer	ates and optional components. If this service
Windows Perception Service	ing.
Windows Presentation Foundation Font Cache 3.0	PF) applications by caching commonly used
Windows Process Activation Service	activation, resource management and healt
Windows Push Notifications System Service	and connection provider which handles the
Windows Push Notifications User Service_d08c7cb	support for local and push notifications. Sup
Windows PushToInstall Service	ice is started automatically and if disabled th
Windows Remote Management (WS-Managemer	WS-Management protocol for remote mana
Windows Search	or files, e-mail, and other content.
Windows Time	s in the network. If this service is stopped, da
Windows Update	Windows and other programs. If this service
Windows Update Medic Service	ents.
WindowsService.Test	
WinHTTP Web Proxy Auto-Discovery Service	pers with a Win32 API and COM Automation
Wired AutoConfig	rming IEEE 802.1X authentication on Etherne
WLAN AutoConfig	iscover, connect to, and disconnect from a v
WMI Performance Adapter	ement Instrumentation (WMI) providers to cl
Work Folders	u to use the files on any of the PCs and devic
Workstation	ers using the SMB protocol. If this service is
World Wide Web Publishing Service	et Information Services Manager
WWAN AutoConfig	This service manages mobile broadband (GSM & CDMA) data card/embedded module adapters and connect
Xbox Accessory Management Service	This service manages connected Xbox Accessories.
Xbox Game Monitoring	This service monitors games.
Xbox Live Auth Manager	Provides authentication and authorization services for interacting with Xbox Live. If this service is stopped, so
Xbox Live Game Save	This service syncs save data for Xbox Live save enabled games. If this service is stopped, game save data will
Xbox Live Networking Service	This service supports the Windows.Networking.XboxLive application programming interface.



Jayatirth Kulkarni > source > repos > TestWindowsService > TestWindowsService > bin > Debug > LogsFile
Name
Date modified
Type
Size
ServiceLog_07-04-2020
04-07-2020 11:57
Text Document
1 KB
ServiceLog_07-04-2020 - Notepad
File Edit Format View Help

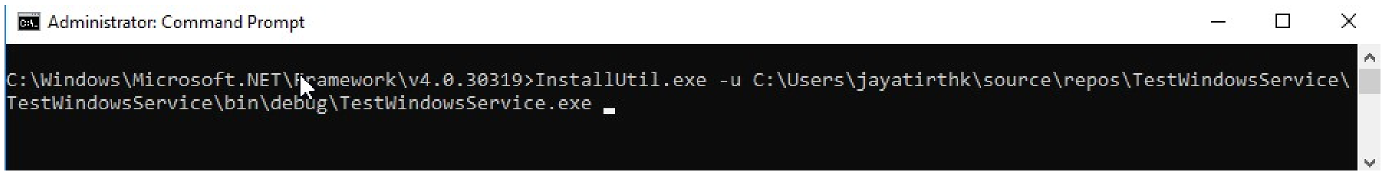
```
Service started at 07-04-2020 11:55:17
Service recalled at 07-04-2020 11:55:27
Service recalled at 07-04-2020 11:55:37
Service recalled at 07-04-2020 11:55:47
Service recalled at 07-04-2020 11:55:57
Service recalled at 07-04-2020 11:56:07
Service stopped at 07-04-2020 11:56:14
Service started at 07-04-2020 11:56:24
Service recalled at 07-04-2020 11:56:34
Service recalled at 07-04-2020 11:56:44
Service recalled at 07-04-2020 11:56:54
Service recalled at 07-04-2020 11:57:04
```

As seen in the above image service has been started and new text file is created. Time is being logged every 10 seconds.

How to Uninstall the Service:

You need to add -u in front of InstallUtil.exe in command prompt following the path of the project.

InstallUtil.exe -u C:\Users\jayatirthk\source\repos\TestWindowsService\TestWindowsService\bin\debug\TestWindowsService.exe



```
C:\Windows\Microsoft.NET\Framework\v4.0.30319>InstallUtil.exe -u C:\Users\jayatirthk\source\repos\TestWindowsService\
TestWindowsService\bin\debug\TestWindowsService.exe
```

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