Windows Service Creation + Deployment (using C#)

This guide will explain you how to create a windows service in Visual Studio 2013. This will also discuss two approaches of deployment. You may use any. You may check Links section to learn more about both approaches of deployment.

First section will give you theoretical back ground. You may jump to second section directly.

Second section will give you step by step walkthroughs.

Version	**Last updated**	Comments	Modified By
V1.0	19-04-2016		Bilal Shahzad

Contents

Theoretical Discussion

How do you create a Windows Service?

1- If you use "Windows Service" template in visual studio, it will create a project with a sample service class.
   a. Service class is a class which should be inheriting from "System.ServiceProcess.ServiceBase" class.
   b. Two methods OnStart() & OnStop() can be overridden here. When you will start or stop service in service manager (after service is installed), these methods will be called.
2- You compile this project and output of this project will be executable. Check next section to learn how to deploy a windows service in "Windows services Manager".

How do you deploy a Windows Service?

You may use one of these two approaches

Using "InstallUtil.exe"

This command line utility comes with .NET Framework & can be found at C:\WINDOWS\Microsoft.NET\Framework\v4.0.30319" location. This utility takes the path of service "executable" created above. This utility looks for an "Installer" class in "executable" so we'll have to make changes in "Windows Service" project created above.

1- To install your service using "installutil.exe", You need to do following steps
   a. Add a class which should be inheriting from "System.Configuration.Install.Installer" class. This will be our installer class. This class should have attribute [RunInstaller(true)]. If it has value "false", "installutil.exe" will ignore this installer.
   b. Installer class (created in above) demands two more objects of type "ServiceProcessInstaller" and "ServiceInstaller"
      private System.ServiceProcess.ServiceProcessInstaller serviceProcessInstaller1;
      private System.ServiceProcess.ServiceInstaller serviceInstaller1;
      And in "Installer" class constructor
      serviceProcessInstaller1 = new System.ServiceProcess.ServiceProcessInstaller();
      serviceInstaller1 = new System.ServiceProcess.ServiceInstaller();

   a. Here "serviceInstaller1" will be linked with our service.
      serviceInstaller1.ServiceName = "Service1";
   b. "serviceProcessInstaller1" will have settings related to service. E.g. UserName, Password, Account
   c. Our installer class has a collection named "Installer". Both above objects should be added to it.
      this.Installers.AddRange(new System.Configuration.Install.Installer[] {
            this.serviceProcessInstaller1, this.serviceInstaller1});

2- Now once project is compiled and ready for deployment. You can install the service. Let say our executable location is "D:\MyService.exe", you can add following commands in a batch file and run that batch.

```
cd\
C:
CD C:\WINDOWS\Microsoft.NET\Framework\v4.0.30319
installutil.exe " D:\MyService.exe "
pause
```

3- And when you want to update the service, always install it first and then install again. To install, you may add following commands in a batch file and run that batch file cd\

```
cd\
C:
CD C:\WINDOWS\Microsoft.NET\Framework\v4.0.30319
installutil.exe /u " D:\MyService.exe "
pause
```

Using "sc" command utility

1- Once you have your executable (without any installers) you can install it directly using SC utility. You can add following commands in a batch file and run that batch. You may install one executable with multiple names in service manager. DisplayName is the label which will be displayed in service manager.

```
SC CREATE MyTestService binPath= " D:\MyService.exe " DisplayName= " MyTestService1 "
pause
```

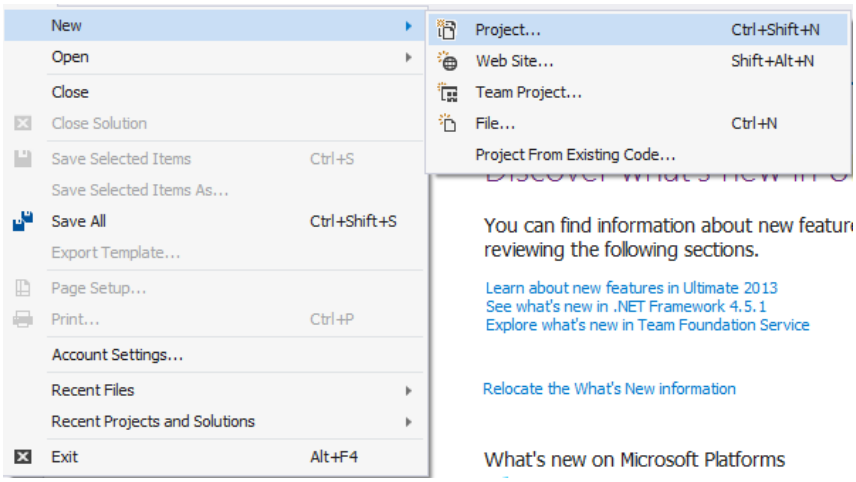
2- To uninstall the service

```
SC DELETE MyTestService
pause
```

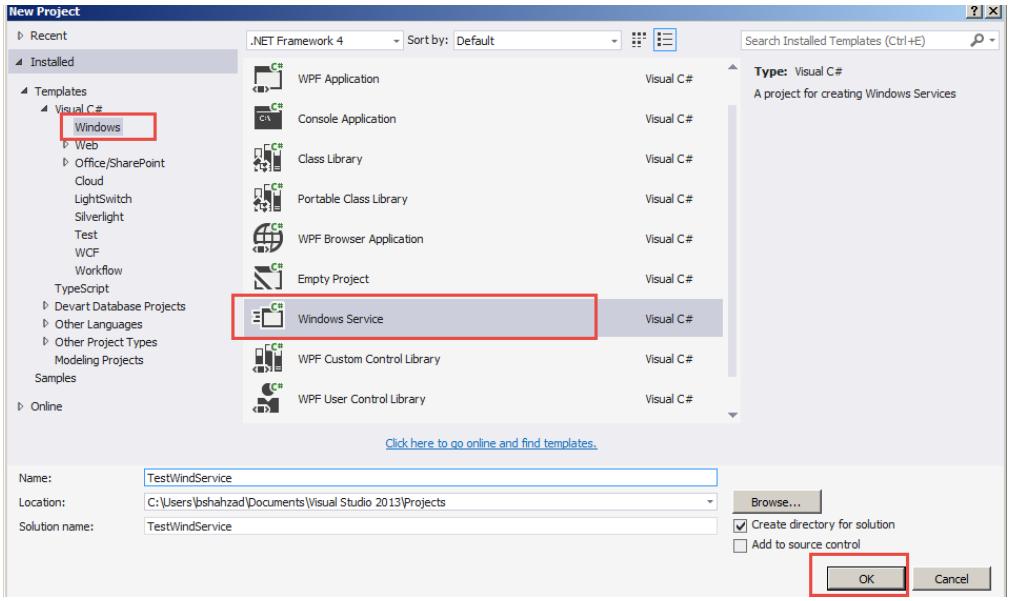
Step by Step Walkthroughs

Create a Windows Service using Visual Studio 2013 + Deployment using "SC"

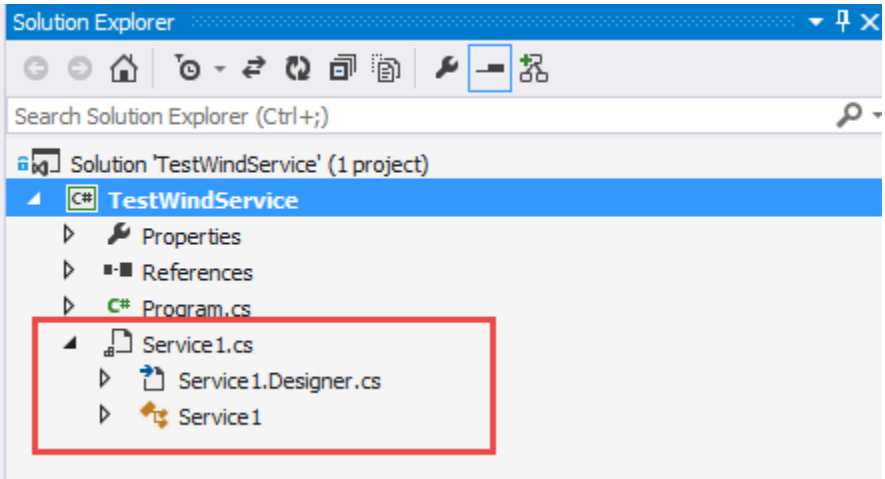
1- Choose File->New->Project



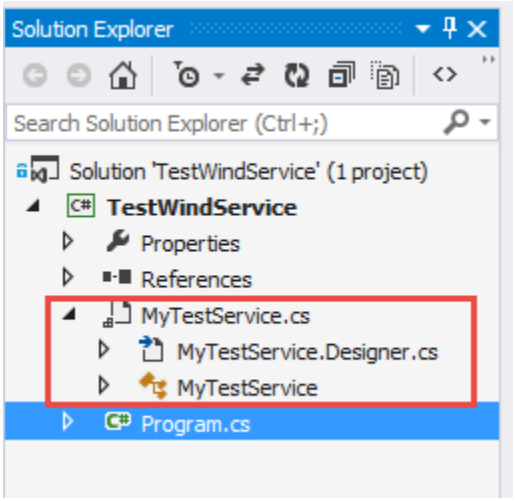
2- Choose "Window Service" template, give a name to your project e.g. TestWindService



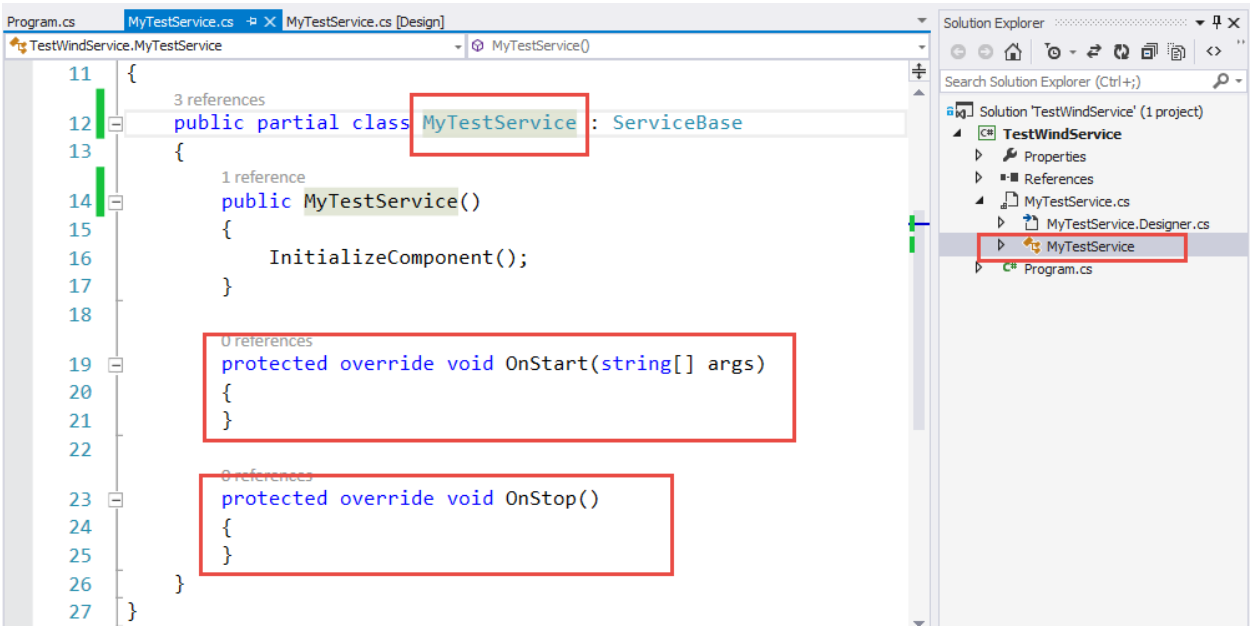
3- By default a service with name "Service1" is created. If you double click on it, it will show a designer.



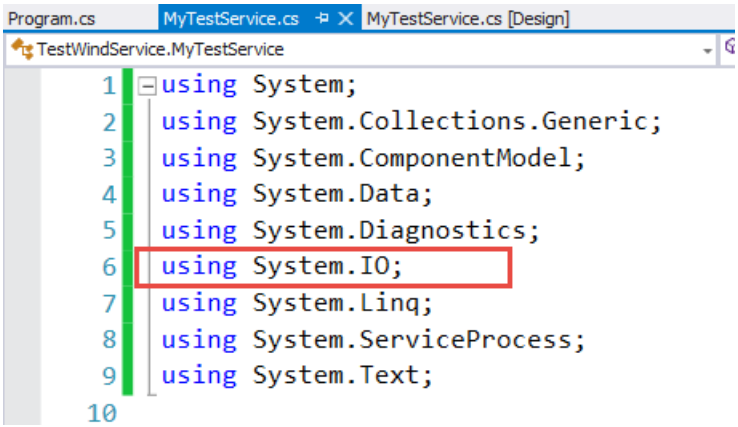
4- Lets change the name of this service file. Right click on "Service1.cs" and rename it. Change its name to "MyTestService.cs". This will also change name of other files being shown under it.



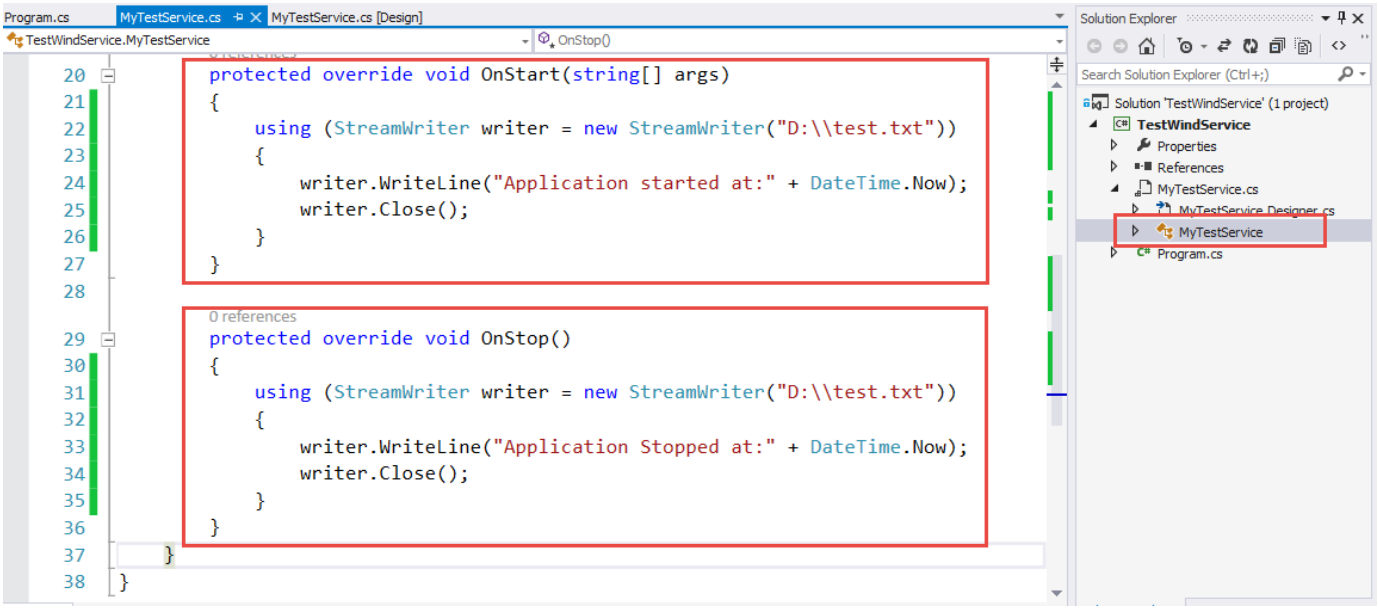
5- If we double click "MyTestService" file in solution explorer, we'll see the code window. Here we can see that our class name is "MyTestService" which is being inherited from "ServiceBase". This class also has overridden two methods "OnStart" & "OnStop". We can write our logic in these methods. When we'll start our service in "Services Manager", OnStart() method is invoked. When we'll stop our service in "Services Manager", OnStop() method is invoked.



6- Let's write some logic in these two methods. First add reference of "System.IO" namespace.

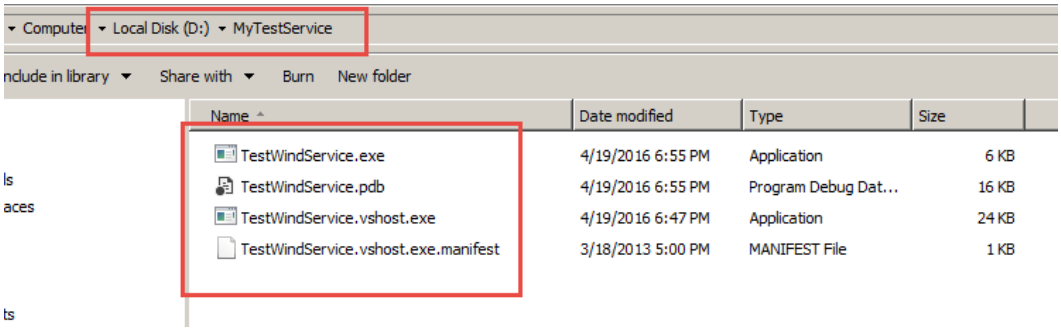


7- Here we are writing a message in a file when service starts and stop. In actual application, we would be doing our initialization stuff in OnStart() event handler and "disposing" related stuff in OnStop() event handler.

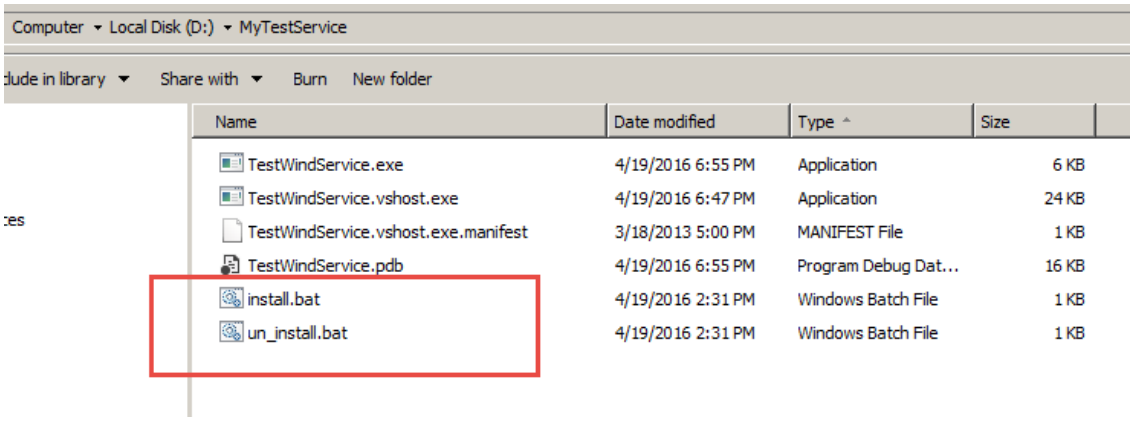


8- Rebuild your project to check if there is any error.

9- Now copy "Debug" folder from "bin" of this project and paste it some place (e.g. D:\ drive). Change the name of the folder to some meaningful name (let say "MyTestService")

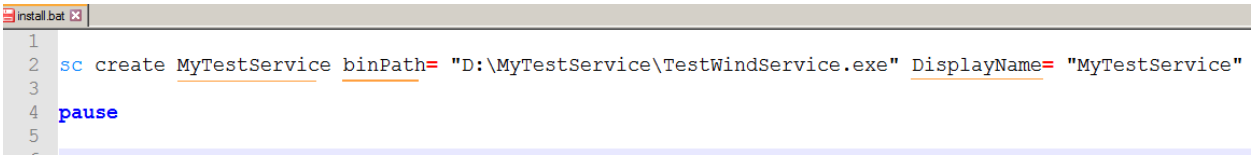


10- New create two batch files (text files but save them with extension .bat).



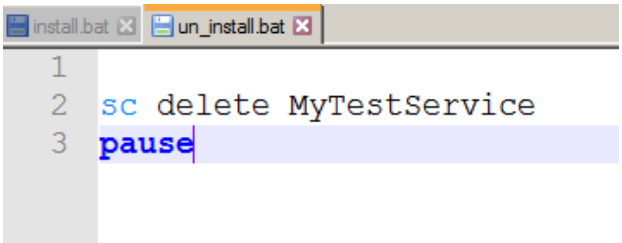
11- Now right click on "install.bat" file and choose "edit" or open this file in any text editor. Add following command in this file and save it.

a. Here "SC CREATE" is to create a service, "MyTestService" is the name we are going to use it in registry then we are providing the path of our "exe" file. In last, we are providing the text which we want to see in "Service Manager".

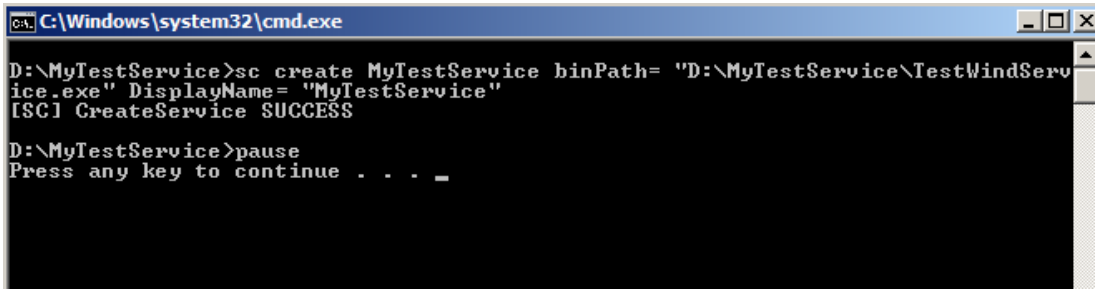


12- Now right click on "un_install.bat" file and choose "edit" or open this file in any text editor. Add following command in this file and save it.

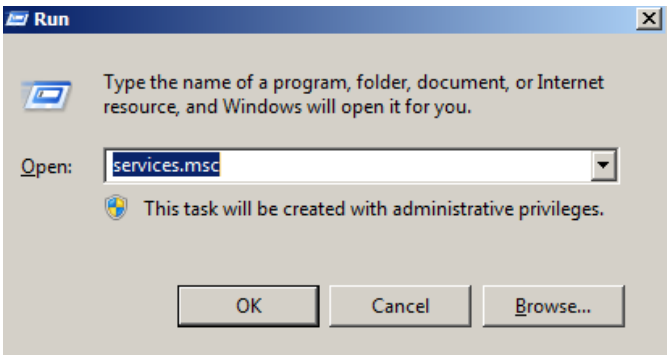
a. Here "SC DELETE" is to delete a service. "MyTestService" is the name of the service which we want to delete from registry.



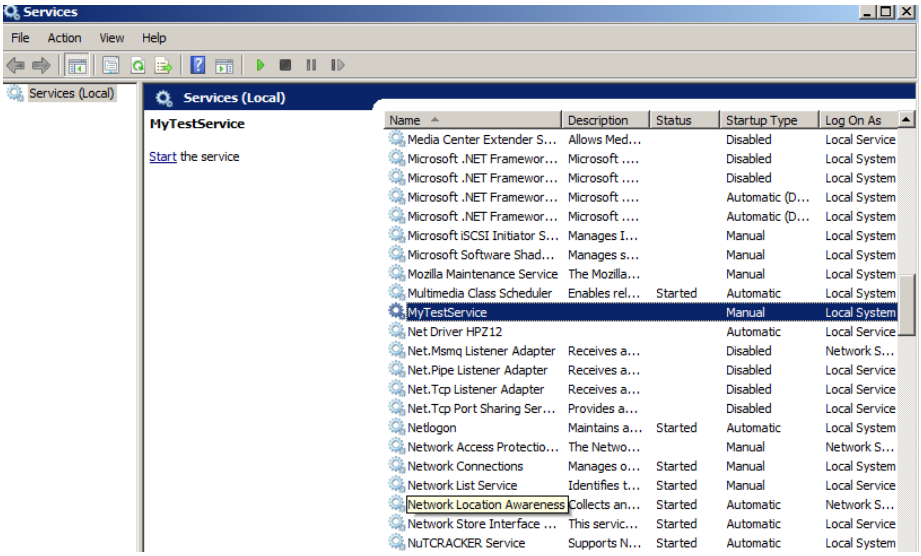
13- Now double click on "install.bat" file to install our windows service. Following windows is displaying the expected result.



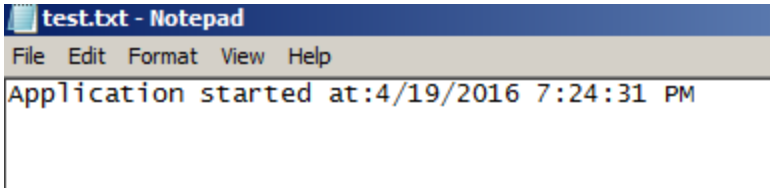
14- Now go to start menu -> run and type "services.msc" and press OK.



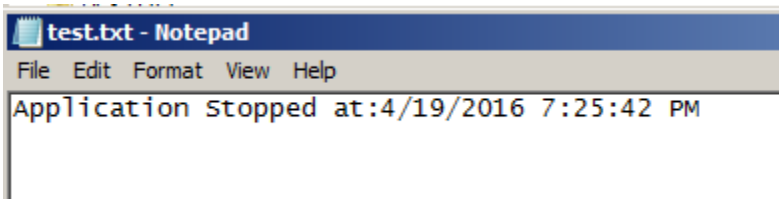
15- It will show the "Services Manager" window. You can find our service in it.



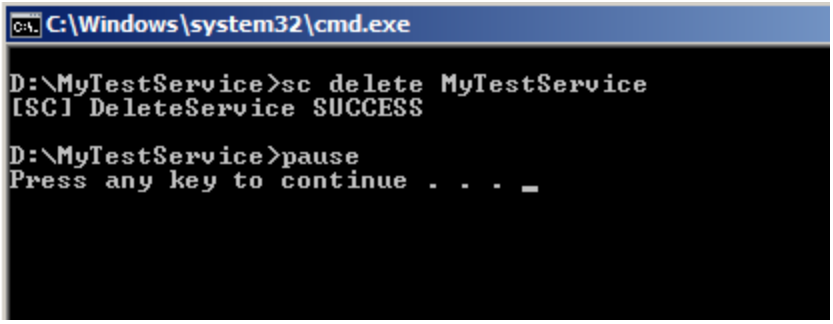
16- You can right click on it to "Start" it. This will raise OnStart() event of our service class.
    a. We have handled the OnStart() event and have written some text in a file in this event. You can check "test.txt" file in "D" drive.



17- You can right click on service to "Stop" it. This will raise OnStop() event of our service class.
    a. We have handled the onStop() event and have written some text in a file in this event. You can check "test.txt" file in "D" drive.



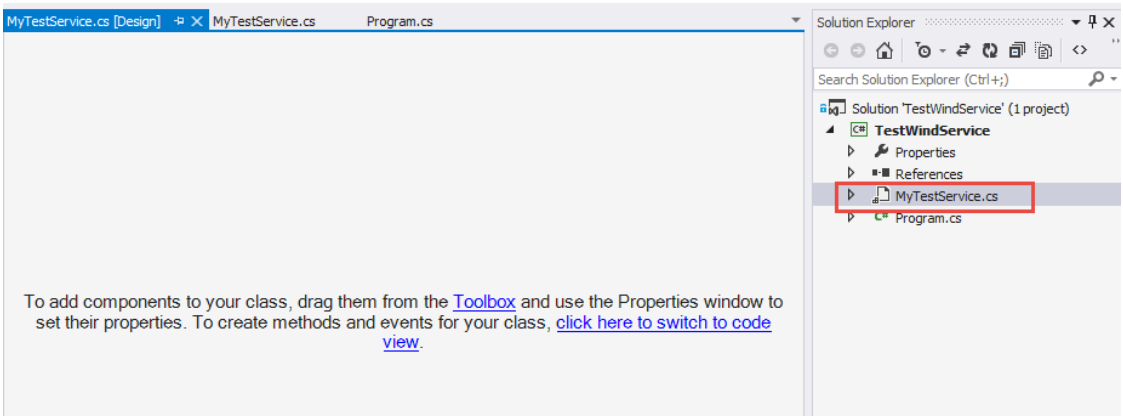
18- You can run "un_install.bat" file to remove the service. . Following windows is displaying the expected result.



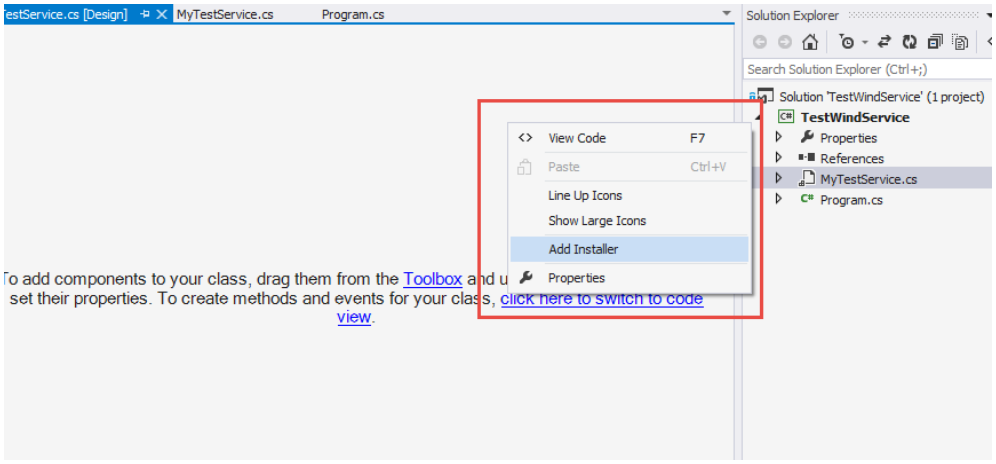
Create a Windows Service using Visual Studio 2013 + Deployment using "installutil.exe"

1- Follow First Seven steps of above tutorial to create a service with sample logic in OnStart() & OnStop() event handler.

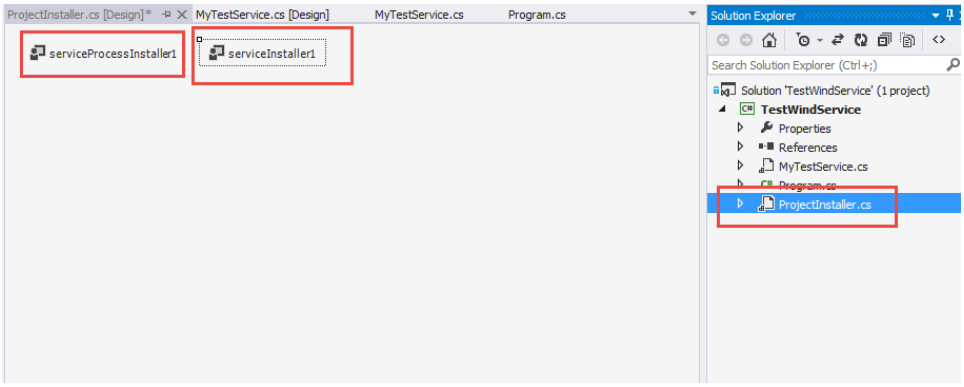
2- Now we want to use "installutil.exe" utility to install a service. This utility looks for "Installer" class in ".exe" file. So we'll have to add an extra component here and need to do some tasks to make our service installable. Double click on "MyTestService.cs" file to view the designer view.



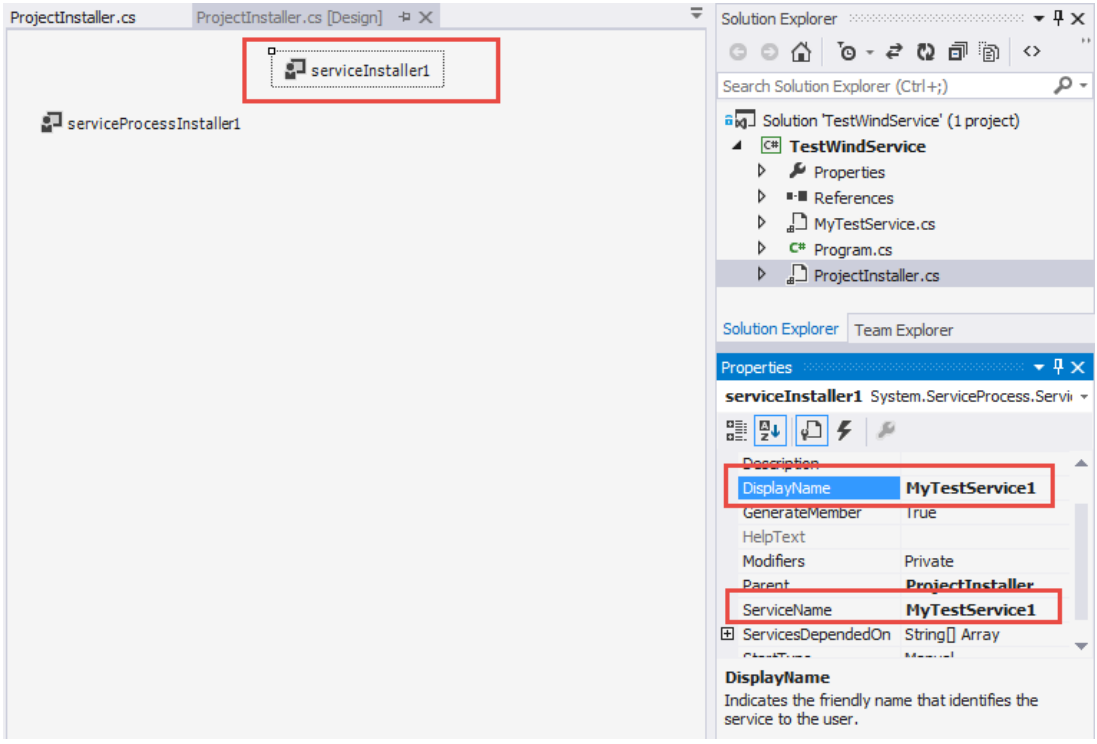
3- Now right click on left panel and choose "Add Installer" option.



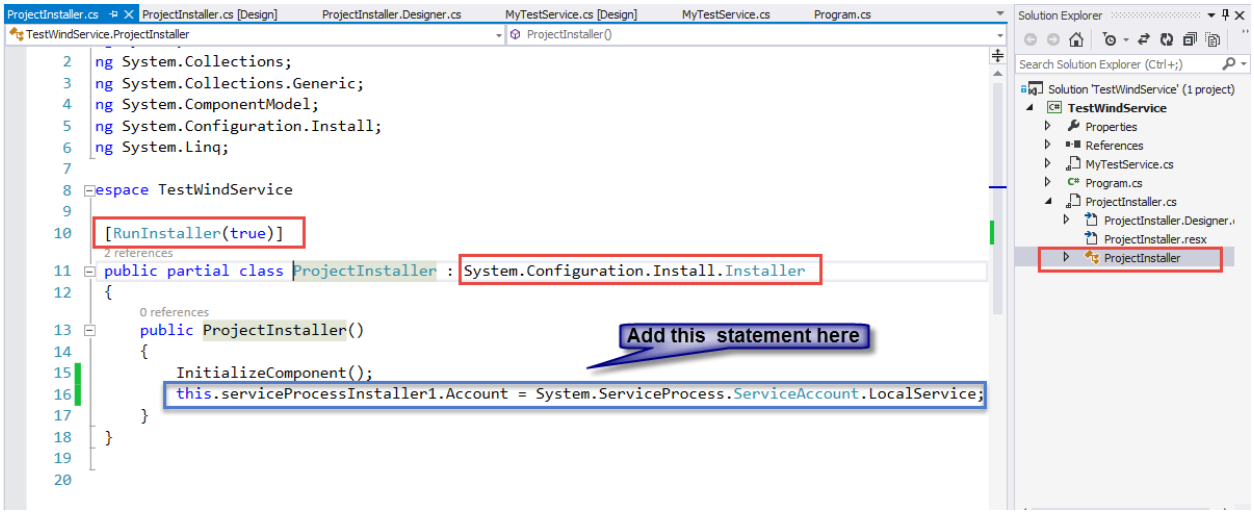
4- Two objects "serviceProcessInstaller1" and "serviceInstaller1" will be added on the layout and declarations of these objects can be seen in code view. Here "serviceInstaller1" is to hold the information of service. There can be more than one ServiceInstaller objects (one per service). "serviceProcessInstaller1" is to handle account or configuration related stuff.



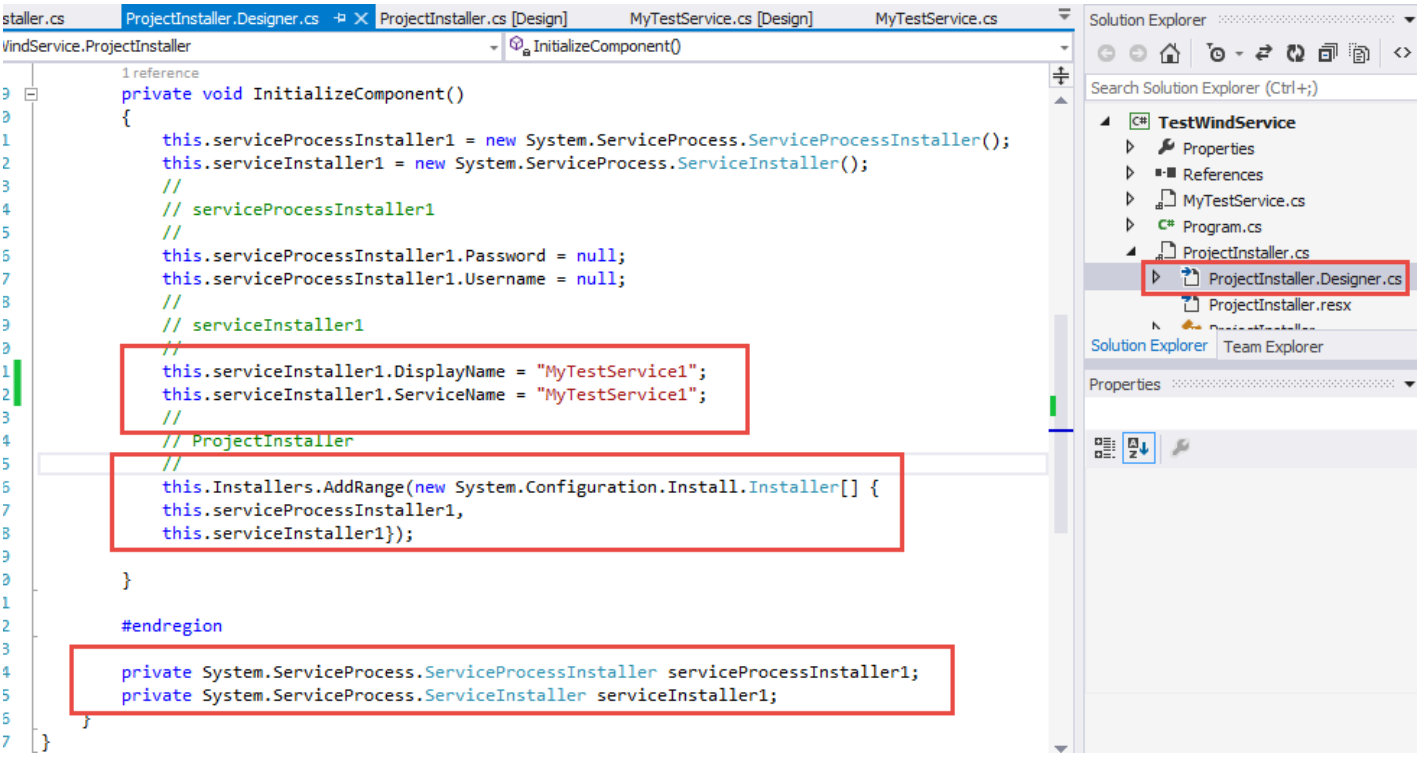
5- Now click on "serviceInstaller1" and Change "DisplayName" & "ServiceName" in "properties" window. These properties will be used while doing installation.



6- Double click on "ProjectInstaller" in solution explorer to open code view. Add highlighted statement in constructor to set the default account type of our process.

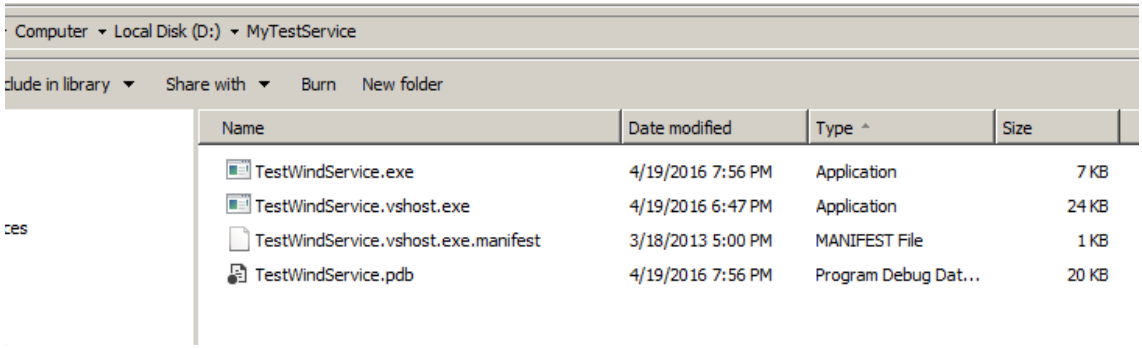


7- Double click on "ProjectInstaller.Designer.cs" file in solution explorer to open code view. Here you can see code which is being generated behind the designer. Here we can verify the theory we discussed in start.

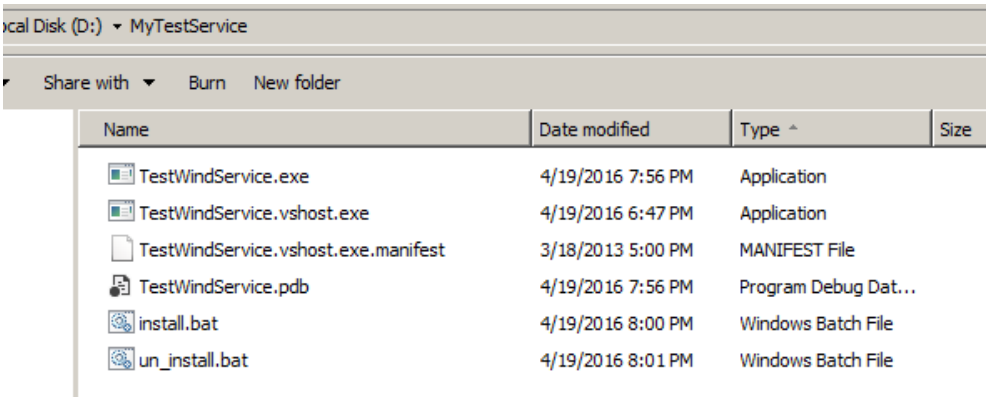


8- Rebuild your project to check if there is any error.

9- Now copy "Debug" folder from "bin" of this project and paste it some place (e.g. D:\ drive). Change the name of the folder to some meaningful name (let say "MyTestService")



10- New create two batch files (text files but save them with extension .bat).



11- Now right click on "install.bat" file and choose "edit" or open this file in any text editor. Add following command in this file and save it.

a. Here "installutil.exe" is to install a service. It comes with .NET Framework. We've given the path of our executable to it. It searches "Installer" class in that exe file to decide which service is to install (e.g. ServiceName, DisplayName)

install.bat

```
cd\
C:

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

installutil.exe "D:\MyTestService\TestWindService.exe"

pause

```

12- Now right click on "un_install.bat" file and choose "edit" or open this file in any text editor. Add following command in this file and save it.

b. Here "installutil.exe /u" is to uninstall a service. We've given the path of our executable to it. It searches "Installer" class in that exe file to decide which service is to uninstall.

un_install.bat

```
cd\
C:

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

installutil.exe /u "D:\MyTestService\TestWindService.exe"

pause
```

13- Now you can follow Steps (13 till 18) from first tutorial. You will see different output on command prompt while doing installation & uninstallation. If you face any error, Please check all the steps again.

Some Useful Links

http://stackoverflow.com/questions/4692250/installing-windows-service-with-sc-exe-or-installutil-exe-there-is-difference

http://stackoverflow.com/questions/3839854/difference-between-serviceprocessinstaller-and-serviceinstaller

https://msdn.microsoft.com/en-us/library/zt39148a%28v=vs.110%29.aspx