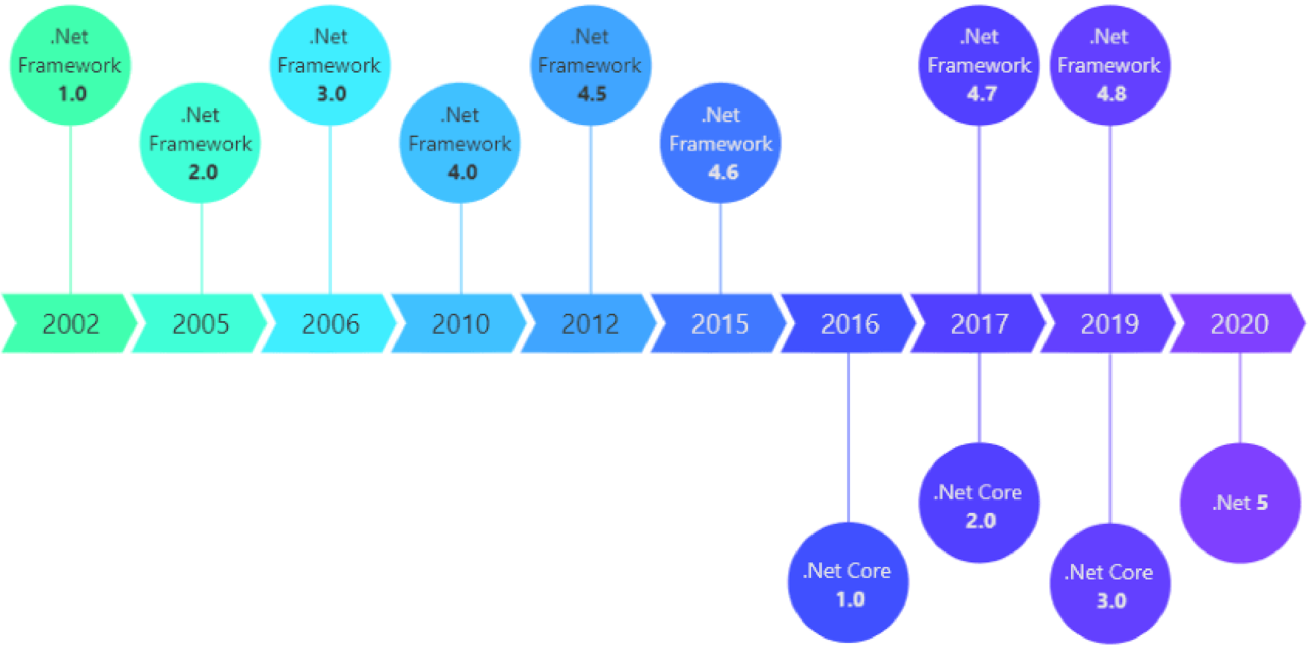
The Story of .NET

- .NET Core is a free, open-source, general-purpose development platform to build cloud-based software applications on Windows, Linux, and macOS whereas Microsoft’s .Net Framework is a software development platform for building and running Windows applications.
- .NET framework was released at 2002 and it only runs on Windows ,then Microsoft released .NET Core at 2016 that's cross platform but it's not completely compatible with the .NET framework apis.
- The last version of .NET framework was 4.8 and was released at 2019 and Microsoft continued with .NET Core but rebranded into the new name `.NET`



Challenges moving from .NET framework to .NET

- Incompatible .NET API calls
- Incompatible NuGet packages
- Difficultiy in assessing .NET portability
- Manual work in porting to .NET

Description

- Porting Assistant for .NET is an analysis tool that scans .NET Framework applications and generates a .NET Core compatibility assessment, helping you port your applications to Linux faster. Porting .NET Framework applications to .NET Core helps customers take advantage of the performance, cost savings, and robust ecosystem of Linux. However, porting applications to .NET Core can be a significant manual effort. Application owners need to spend valuable time identifying the dependencies and APIs that are incompatible with .NET Core, and estimating the level of effort involved. Porting Assistant for .NET quickly scans .NET Framework applications to identify incompatibilities with .NET Core, finds known replacements, and generates a detailed compatibility assessment. This reduces the manual effort involved in modernizing your applications to Linux .

Get .NET Porting Assistant

- Porting Assistant for .NET is fully open-sourced.
- You can use the Porting Assistant in any of these flavors:
  - Standalone client
  - Visual Studio IDE extension

Prerequisites

- .NET 6 SDK Download from here
- Windows 7 or later
- Internet connectivity on the machine running the assessment
- If your machine is behind a proxy with restricted internet access, you must permit access to the following:
  - Amazon S3 Datastore
  - Amazon S3 Datastore authenticaiton endpoint
  - GitHub datastore
  - GitHub user content
  - NuGet or additional package addresses — any addresses required to restore your project packages (the most common one being api.nuget.com)
- Administrator access
- Processor with 1.8 GHz or above processing speed
- 4 GB minimum of available memory (We would need higher memory requirments as long as the solution is larger)
- 5 GB minimum of free disk space

Demo Workflow

- I will use the Porting Assistant Stanalone Client to assess and port Music Store App from .NET framework to .NET .

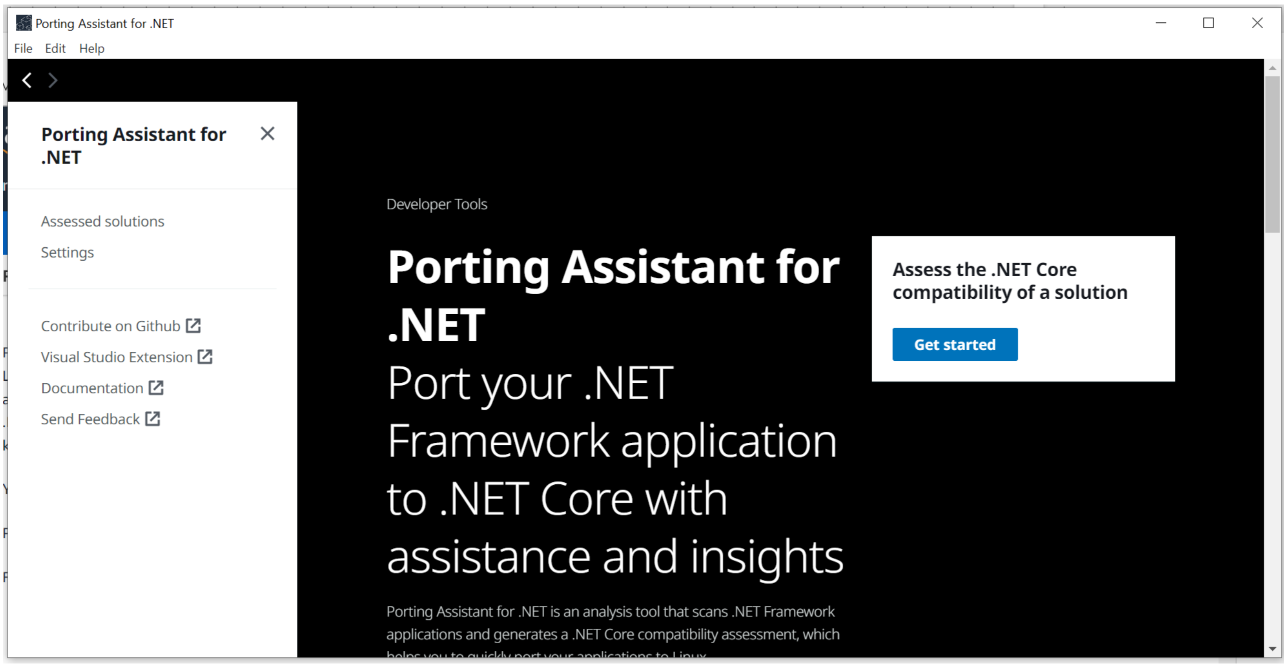
Installation

- Download and Install the .NET Porting Assistant from here

Assess The Solution

- Open the porting assistant

- Click on `Getting Started` Button

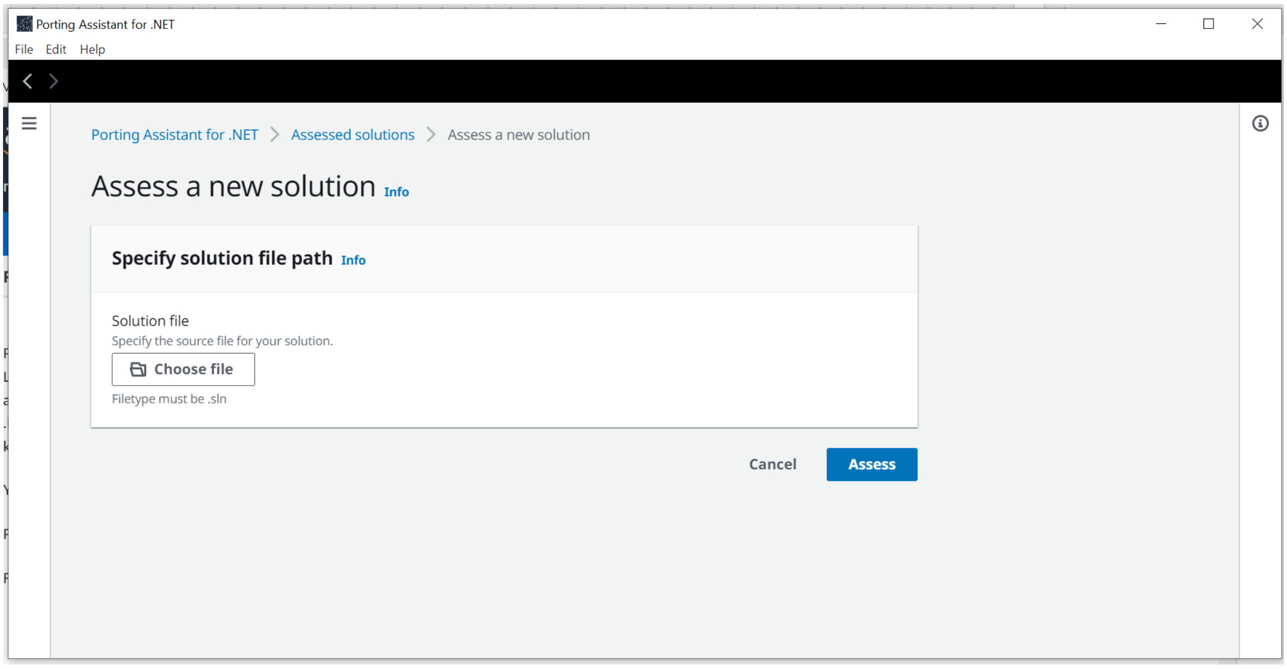


Porting Assistant for .NET

Port your .NET Framework application to .NET Core with assistance and insights

Porting Assistant for .NET is an analysis tool that scans .NET Framework applications and generates a .NET Core compatibility assessment, which helps you to quickly port your applications to Linux.

- You should see `Assess New Solution` Page or Click on `Assess a New Solution` button to view it


Porting Assistant for .NET
File Edit Help
Porting Assistant for .NET > Assessed solutions > Assess a new solution
Info
Info
Choose file
Cancel
Assess

Assess a new solution

Specify solution file path

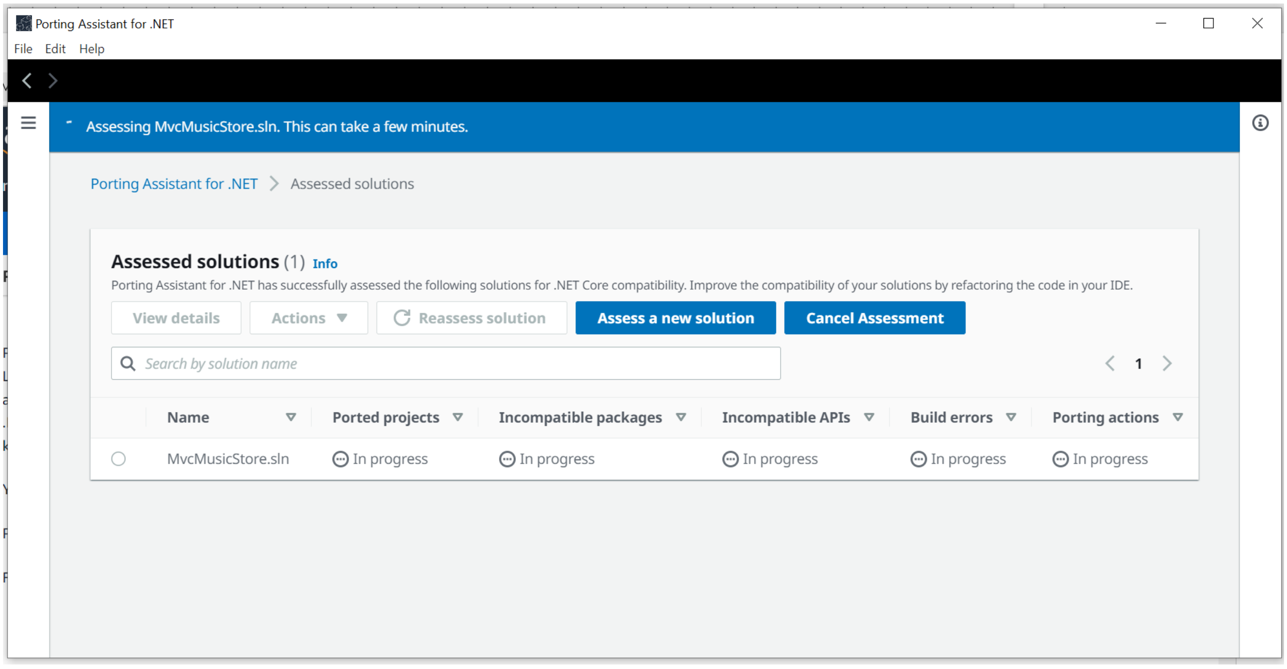
Solution file

Specify the source file for your solution.

Filetype must be .sln

- Click on `Choose file` and locate the solution file of your project that you want to modernize ,it must be a `.sln` file

- The porting assistant will start scanning and analyzing the application



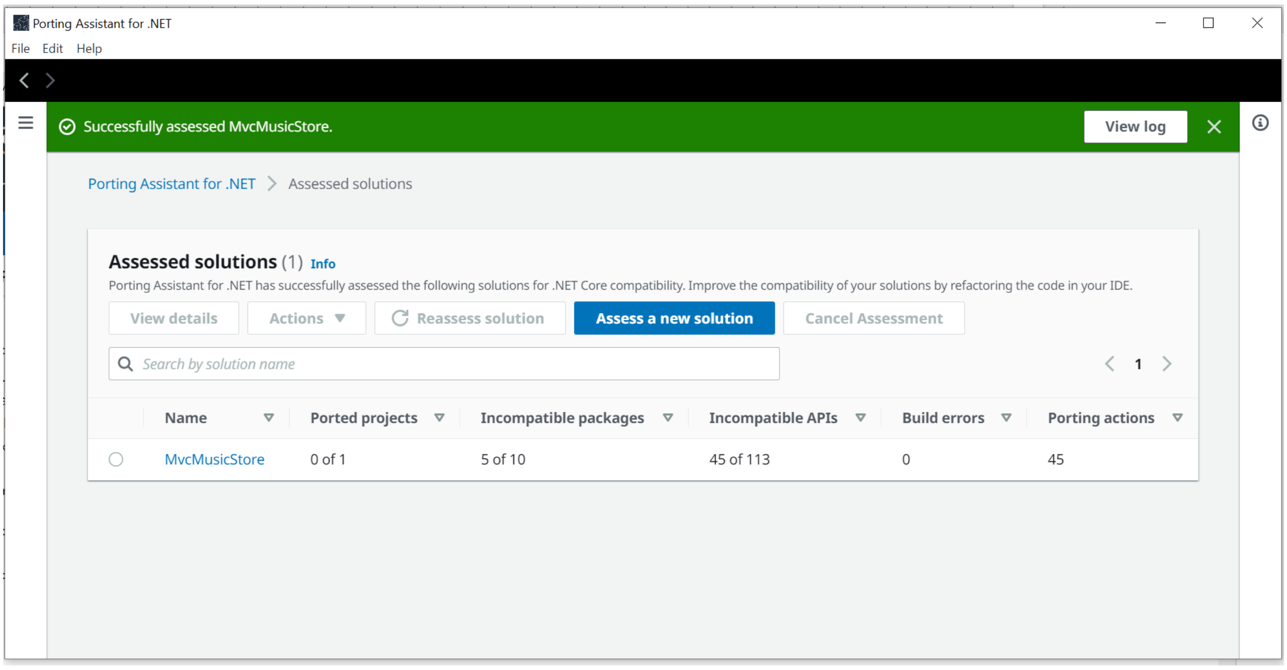
Assessing MvcMusicStore.sln. This can take a few minutes.

Assessed solutions (1)

Porting Assistant for .NET has successfully assessed the following solutions for .NET Core compatibility. Improve the compatibility of your solutions by refactoring the code in your IDE.

	Name	Ported projects	Incompatible packages	Incompatible APIs	Build errors	Porting actions
○	MvcMusicStore.sln	In progress	In progress	In progress	In progress	In progress

- Wait for some time till the porting assistant finishes assessing the app, this time depends on the size of the application



Successfully assessed MvcMusicStore.

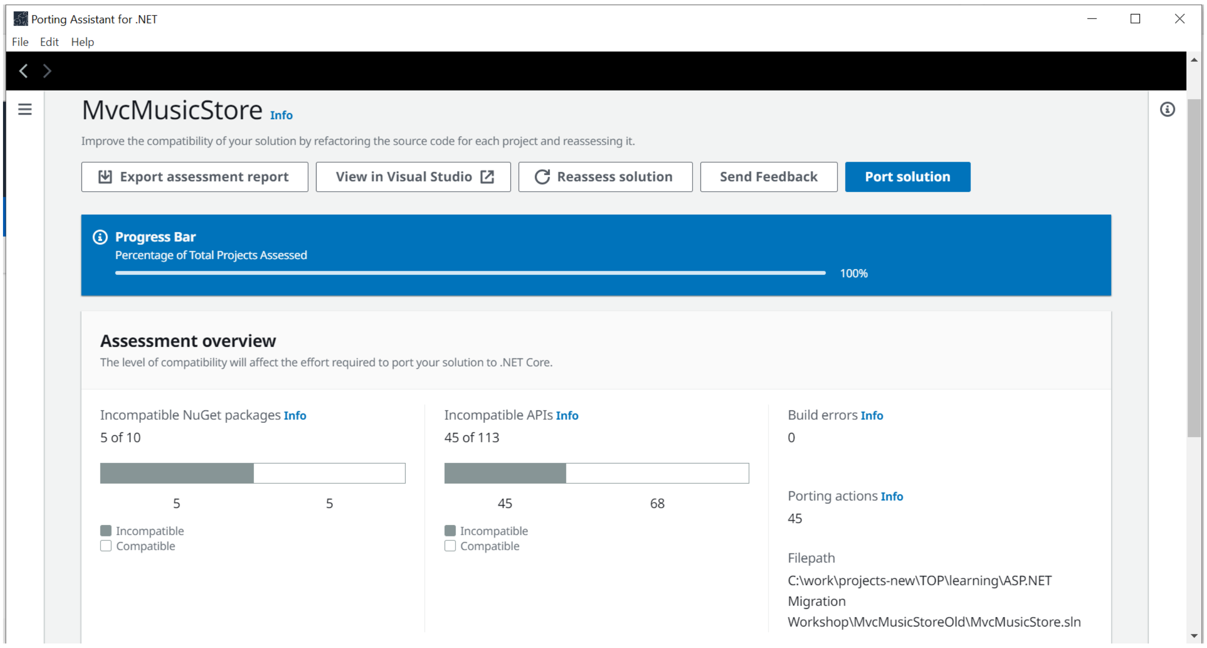
Assessed solutions (1)

Porting Assistant for .NET has successfully assessed the following solutions for .NET Core compatibility. Improve the compatibility of your solutions by refactoring the code in your IDE.

	Name	Ported projects	Incompatible packages	Incompatible APIs	Build errors	Porting actions
○	MvcMusicStore	0 of 1	5 of 10	45 of 113	0	45

- Let's review the assessed solution
- Click on the solution name from the `Assessed Solutions` page
- You would see the Assessment overview at the top of the page, with statistics about :
  - Incompatible NuGet packages
  - Incompatible APIs
  - Build errors

- Porting Actions



MvcMusicStore Info

Improve the compatibility of your solution by refactoring the source code for each project and reassessing it.

Progress Bar
Percentage of Total Projects Assessed
100%

Assessment overview
The level of compatibility will affect the effort required to port your solution to .NET Core.

Incompatible NuGet packages Info
5 of 10
5 5
Incompatible
Compatible

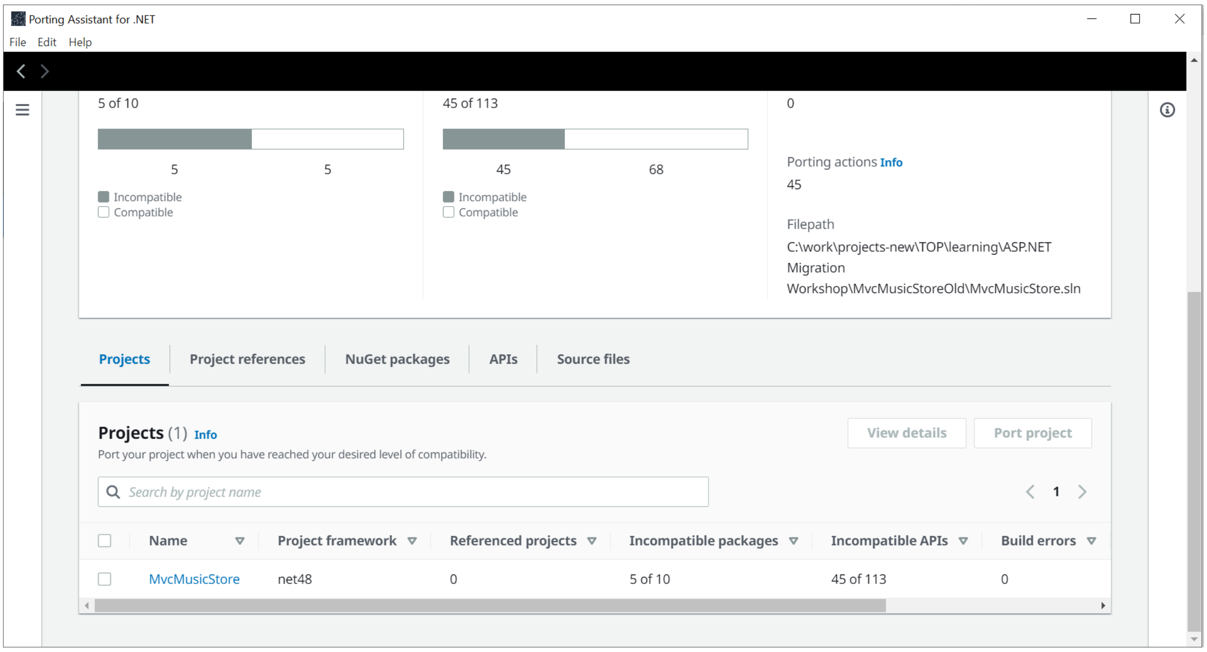
Incompatible APIs Info
45 of 113
45 68
Incompatible
Compatible

Build errors Info
0

Porting actions Info
45

Filepath
C:\work\projects-new\TOP\learning\ASP.NET Migration Workshop\MvcMusicStoreOld\MvcMusicStore.sln

- At the bottom of the page you would see:
    - Included Projects summary with brief about each project including:
        - Framework Version
        - Referenced Projects
        - Incompataible packages
        - Incompatabile APIs
        - Build errors
        - Porting Actions
        - Port Status



5 of 10
5 5
Incompatible
Compatible

45 of 113
45 68
Incompatible
Compatible

0

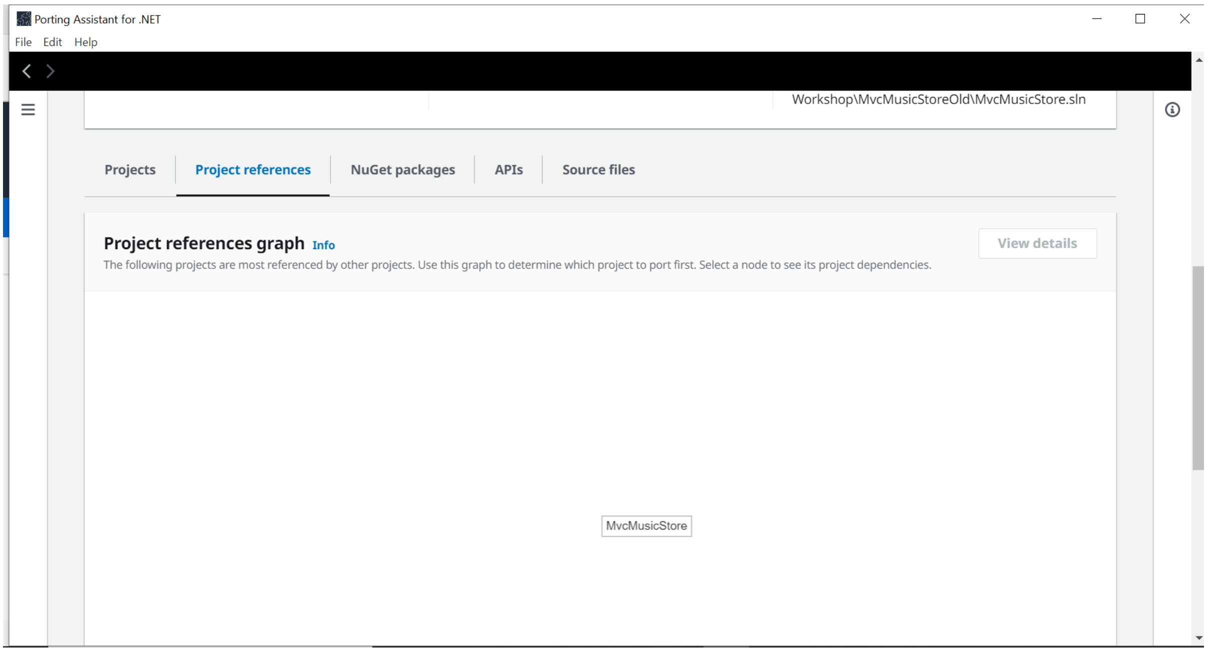
Porting actions Info
45

Filepath
C:\work\projects-new\TOP\learning\ASP.NET Migration Workshop\MvcMusicStoreOld\MvcMusicStore.sln

Projects (1) Info
Port your project when you have reached your desired level of compatibility.

□	Name	Project framework	Referenced projects	Incompatible packages	Incompatible APIs	Build errors
□	MvcMusicStore	net48	0	5 of 10	45 of 113	0

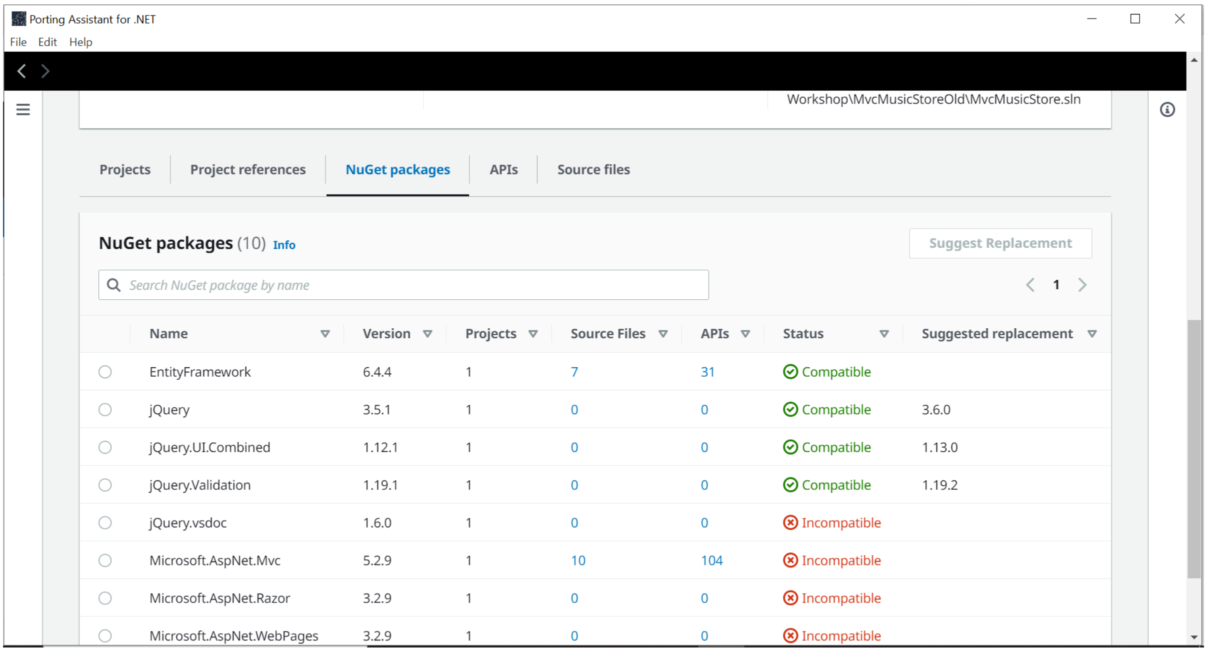
- Project Reference Graph ,which shows the dependency graph of the included project in the solution



Project references graph

The following projects are most referenced by other projects. Use this graph to determine which project to port first. Select a node to see its project dependencies.

- NuGet Packages with some information about the used packages in the solution including:
  - Name
  - Version
  - Projects (Number of projects in which this package is used)
  - Source Files (Number of files in which this package is used)
  - APIs (Number of apis used from this package)
  - Status (Either compatible or Incompatible)
  - Suggested Replacement (Suggested package version to replace the used package with)

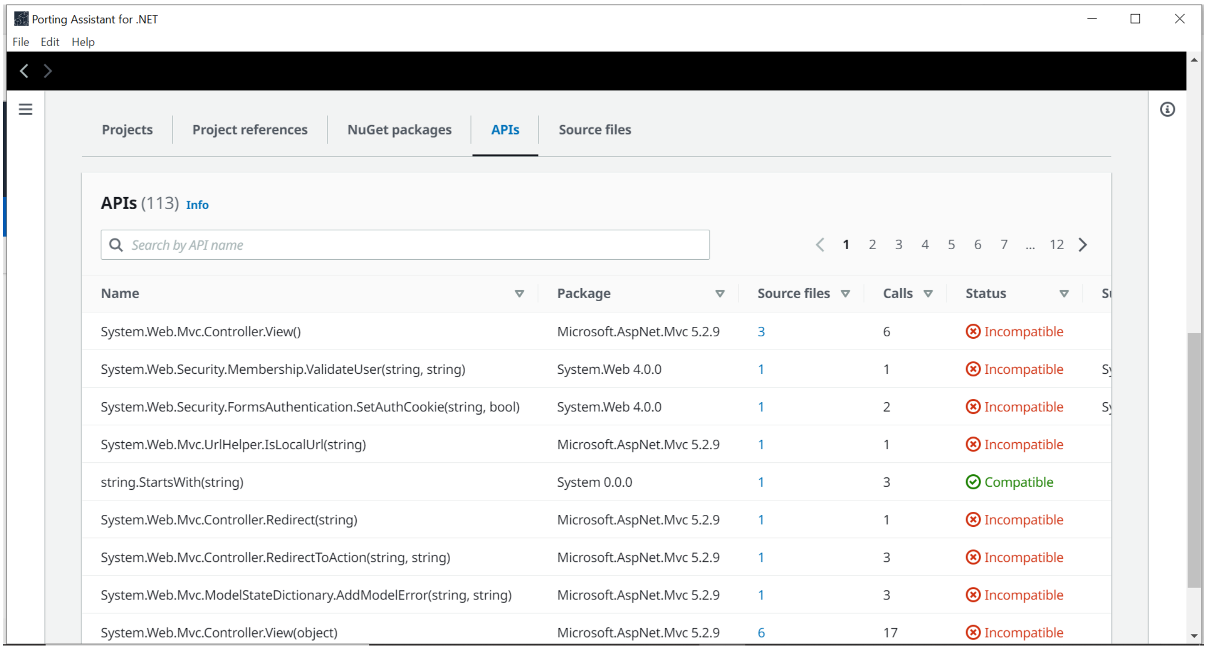

Porting Assistant for .NET
File
Edit
Help
Workshop\MvcMusicStoreOld\MvcMusicStore.sln
Projects
Project references
NuGet packages
APIs
Source files
Info
Suggest Replacement
Search NuGet package by name
1

NuGet packages (10)

	Name	Version	Projects	Source Files	APIs	Status	Suggested replacement
○	EntityFramework	6.4.4	1	7	31	✓ Compatible	
○	jQuery	3.5.1	1	0	0	✓ Compatible	3.6.0
○	jQuery.UI.Combined	1.12.1	1	0	0	✓ Compatible	1.13.0
○	jQuery.Validation	1.19.1	1	0	0	✓ Compatible	1.19.2
○	jQuery.vsdoc	1.6.0	1	0	0	⊗ Incompatible	
○	Microsoft.AspNet.Mvc	5.2.9	1	10	104	⊗ Incompatible	
○	Microsoft.AspNet.Razor	3.2.9	1	0	0	⊗ Incompatible	
○	Microsoft.AspNet.WebPages	3.2.9	1	0	0	⊗ Incompatible	

- APIs with some information about the used apis in the solution including:
  - Name
  - Package
  - Source Files (Number of files in which this api is used)
  - Calls (Number of calls to this api)

    - Status (Either compatible or Incompatible)
    - Suggested Replacement (Suggested api to replace the used api with)

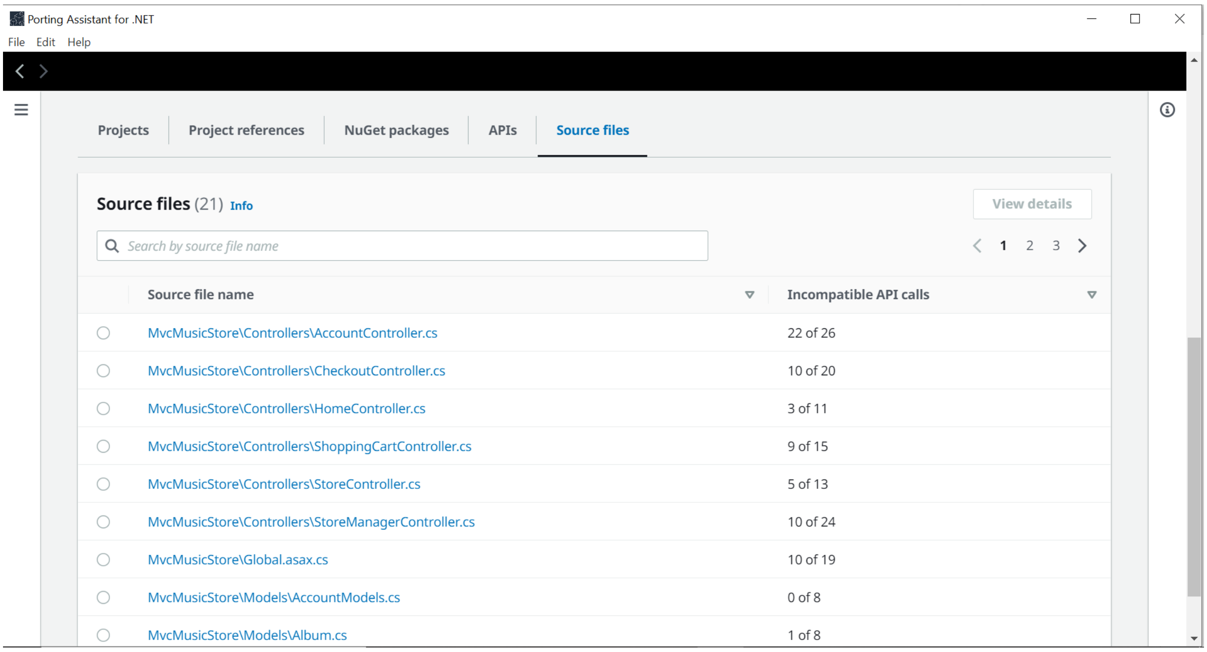


APIs (113) Info

Name	Package	Source files	Calls	Status	S
System.Web.Mvc.Controller.View()	Microsoft.AspNet.Mvc 5.2.9	3	6	⊗ Incompatible	
System.Web.Security.Membership.ValidateUser(string, string)	System.Web 4.0.0	1	1	⊗ Incompatible	Sy
System.Web.Security.FormsAuthentication.SetAuthCookie(string, bool)	System.Web 4.0.0	1	2	⊗ Incompatible	Sy
System.Web.Mvc.UrlHelper.IsLocalUrl(string)	Microsoft.AspNet.Mvc 5.2.9	1	1	⊗ Incompatible	
string.StartsWith(string)	System 0.0.0	1	3	✓ Compatible	
System.Web.Mvc.Controller.Redirect(string)	Microsoft.AspNet.Mvc 5.2.9	1	1	⊗ Incompatible	
System.Web.Mvc.Controller.RedirectToAction(string, string)	Microsoft.AspNet.Mvc 5.2.9	1	3	⊗ Incompatible	
System.Web.Mvc.ModelStateDictionary.AddModelError(string, string)	Microsoft.AspNet.Mvc 5.2.9	1	3	⊗ Incompatible	
System.Web.Mvc.Controller.View(object)	Microsoft.AspNet.Mvc 5.2.9	6	17	⊗ Incompatible	

  - Source Files with some information about the used files in the solution including:

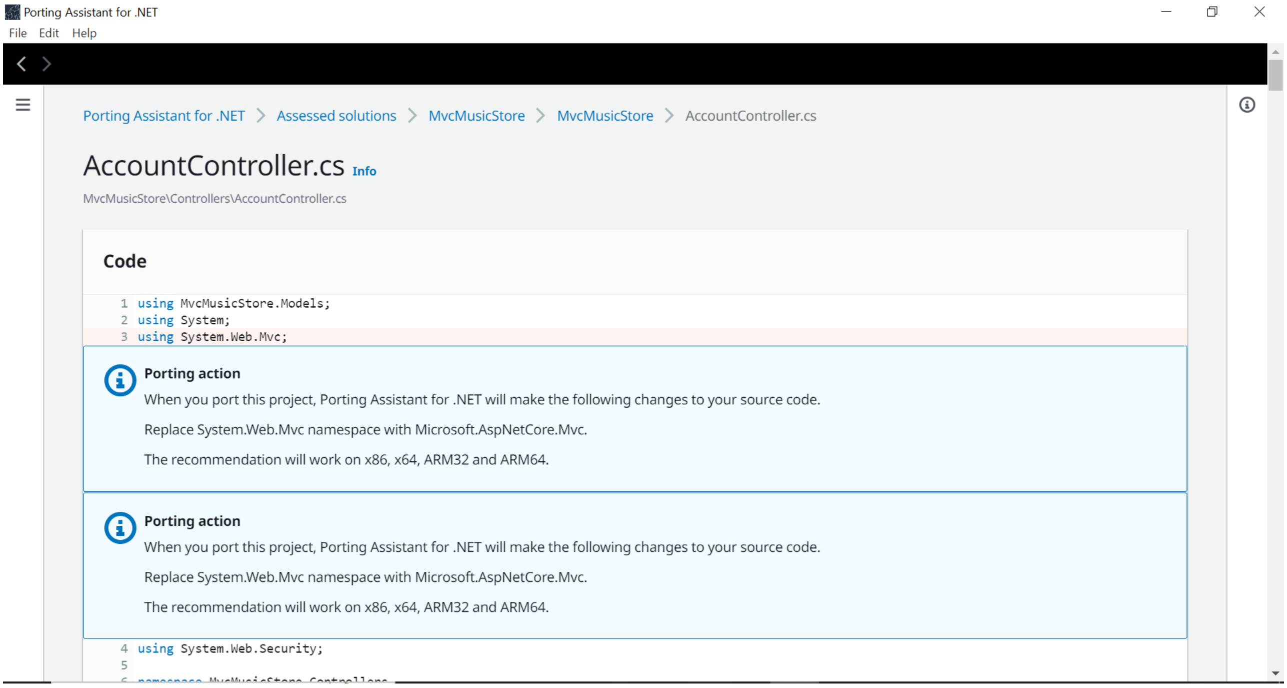
    - Source File Name
    - Incompatible API calls (Statistics about `Number of incompatible api calls / Total number of api calls` used in the file)



Source files (21) Info

	Source file name	Incompatible API calls
○	MvcMusicStore\Controllers\AccountController.cs	22 of 26
○	MvcMusicStore\Controllers\CheckoutController.cs	10 of 20
○	MvcMusicStore\Controllers\HomeController.cs	3 of 11
○	MvcMusicStore\Controllers\ShoppingCartController.cs	9 of 15
○	MvcMusicStore\Controllers\StoreController.cs	5 of 13
○	MvcMusicStore\Controllers\StoreManagerController.cs	10 of 24
○	MvcMusicStore\Global.asax.cs	10 of 19
○	MvcMusicStore\Models\AccountModels.cs	0 of 8
○	MvcMusicStore\Models\Album.cs	1 of 8

- You could click on the file name from `Source Files` or select the file and click on `View Details` to view the file with the Porting Assistant notes and recommendations



Porting Assistant for .NET > Assessed solutions > MvcMusicStore > MvcMusicStore > AccountController.cs

AccountController.cs Info

MvcMusicStore\Controllers\AccountController.cs

Code

```
using MvcMusicStore.Models;
using System;
using System.Web.Mvc;
```

Porting action

When you port this project, Porting Assistant for .NET will make the following changes to your source code.

Replace System.Web.Mvc namespace with Microsoft.AspNetCore.Mvc.

The recommendation will work on x86, x64, ARM32 and ARM64.

Porting action

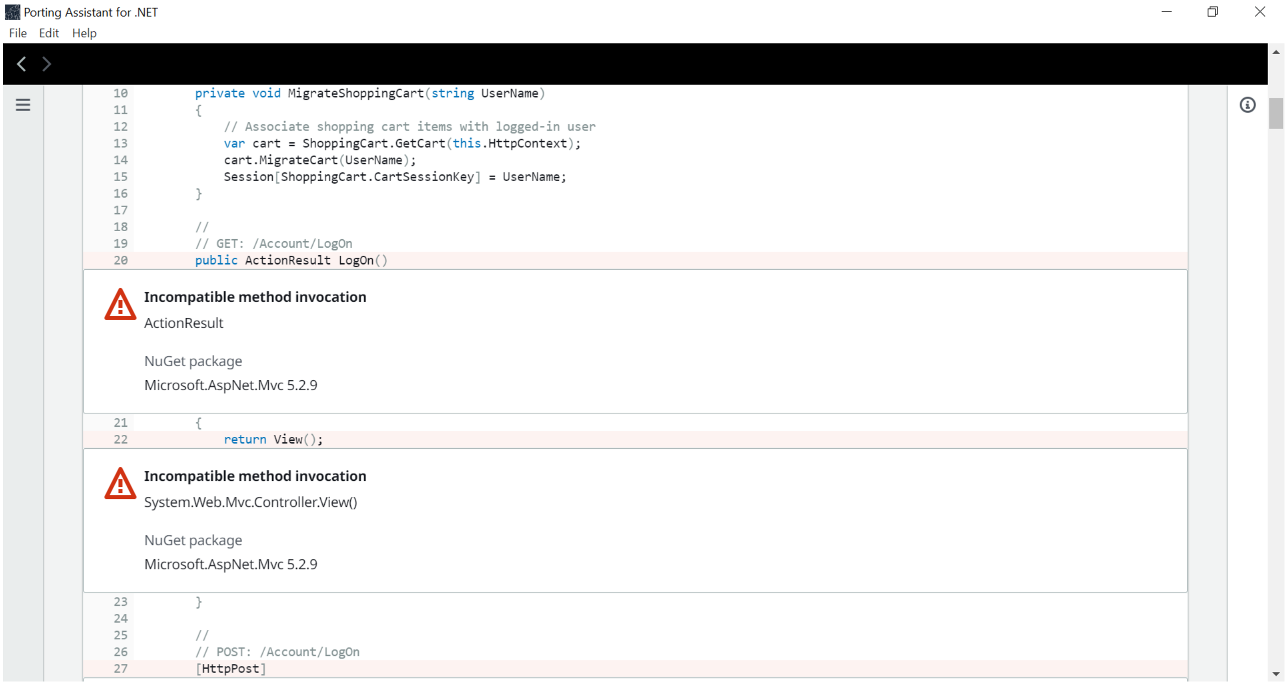
When you port this project, Porting Assistant for .NET will make the following changes to your source code.

Replace System.Web.Mvc namespace with Microsoft.AspNetCore.Mvc.

The recommendation will work on x86, x64, ARM32 and ARM64.

```
using System.Web.Security;

namespace MvcMusicStore.Controllers
```



```
        private void MigrateShoppingCart(string UserName)
        {
            // Associate shopping cart items with logged-in user
            var cart = ShoppingCart.GetCart(this.HttpContext);
            cart.MigrateCart(UserName);
            Session[ShoppingCart.CartSessionKey] = UserName;
        }

        //
        // GET: /Account/LogOn
        public ActionResult LogOn()
```

Incompatible method invocation

ActionResult

NuGet package

Microsoft.AspNet.Mvc 5.2.9

```
        {
            return View();
```

Incompatible method invocation

System.Web.Mvc.Controller.View()

NuGet package

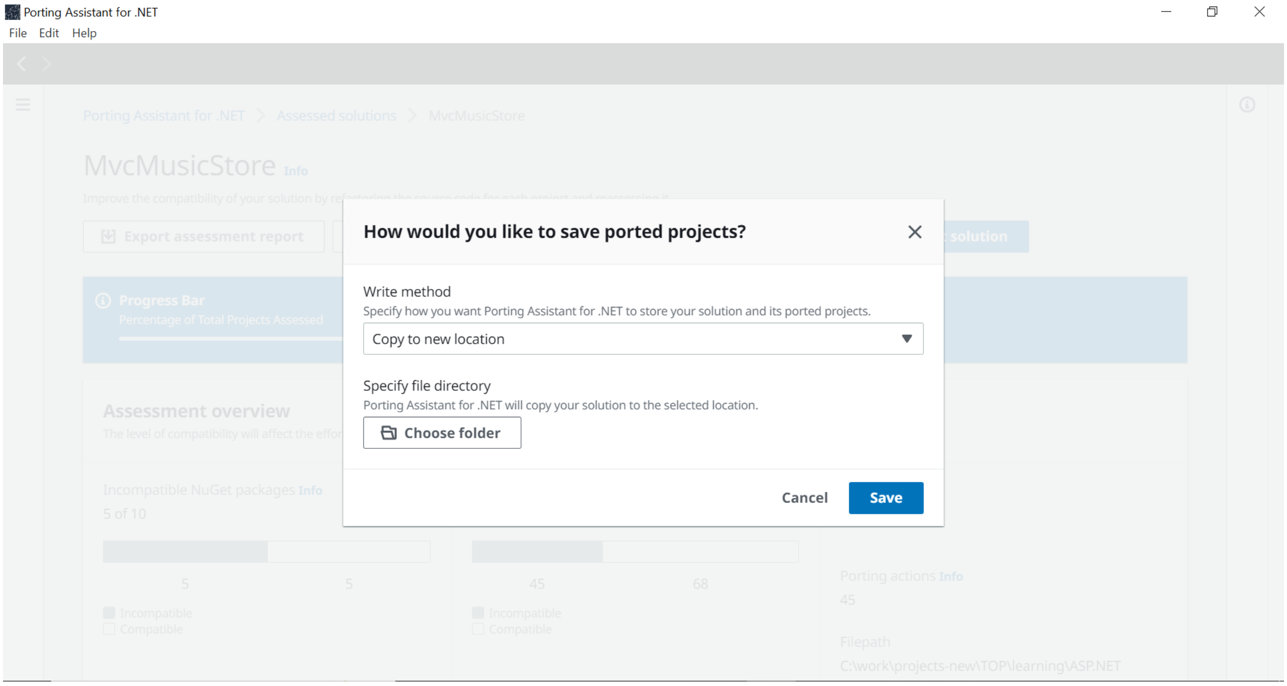
Microsoft.AspNet.Mvc 5.2.9

```
        }

        //
        // POST: /Account/LogOn
        [HttpPost]
```

Port the solution

- The Porting Assistant can help you porting the application by applying some porting actions like upgrading packages , replacing incompatible api calls,..etc but there still some actions that needs to be done manually and you could use the Porting Assistant to help identify those actions .
- Click on the solution name from the `Assessed solutions` page and click on `Port Solution` Button , Then choose Either to Modify in place or Copy to new location and choose the location path


Porting Assistant for .NET
File Edit Help
Porting Assistant for .NET > Assessed solutions > MvcMusicStore
MvcMusicStore Info
Export assessment report
Progress Bar
Percentage of Total Projects Assessed
Assessment overview
Incompatible NuGet packages Info
5 of 10
Incompatible
Compatible
Porting actions Info
45
Filepath
C:\work\projects-new\TOP\learning\ASP.NET

How would you like to save ported projects?

Write method

Specify how you want Porting Assistant for .NET to store your solution and its ported projects.

Copy to new location

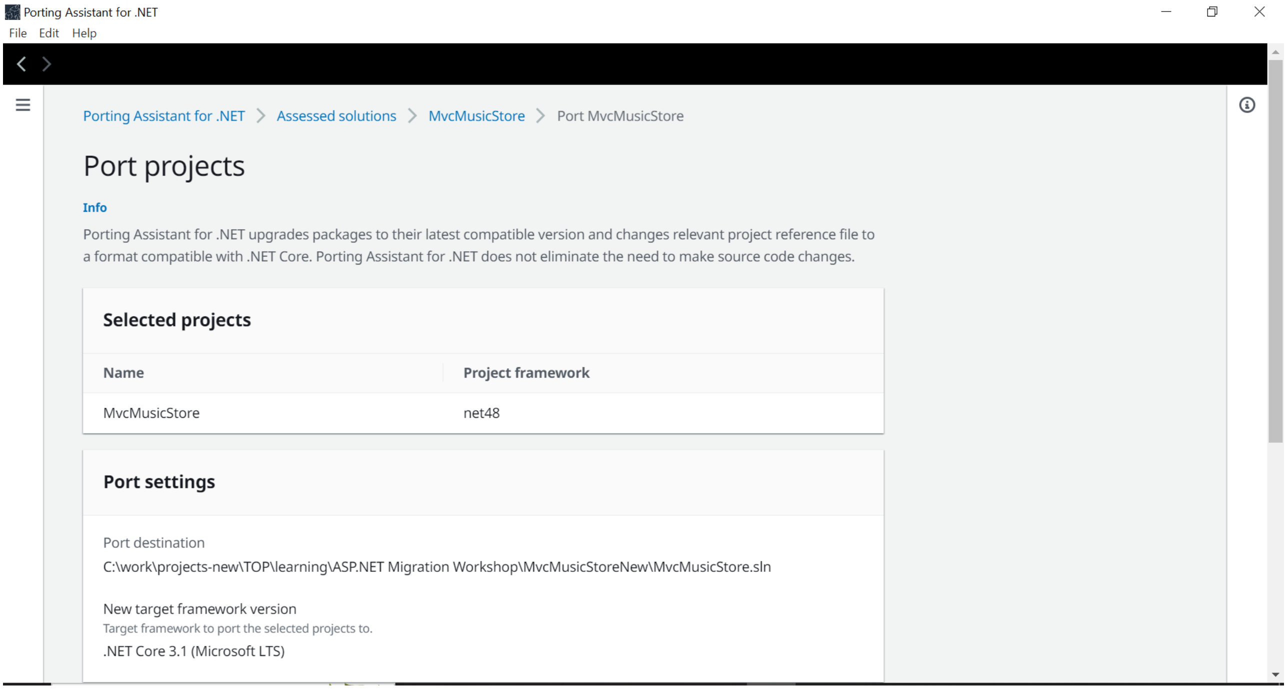
Specify file directory

Porting Assistant for .NET will copy your solution to the selected location.

Choose folder

Cancel Save

- You will be directed to a page where you can view some porting settings and NuGet packages upgrade


Porting Assistant for .NET
File Edit Help
Porting Assistant for .NET > Assessed solutions > MvcMusicStore > Port MvcMusicStore

Port projects

Info

Porting Assistant for .NET upgrades packages to their latest compatible version and changes relevant project reference file to a format compatible with .NET Core. Porting Assistant for .NET does not eliminate the need to make source code changes.

Selected projects

Name	Project framework
MvcMusicStore	net48

Port settings

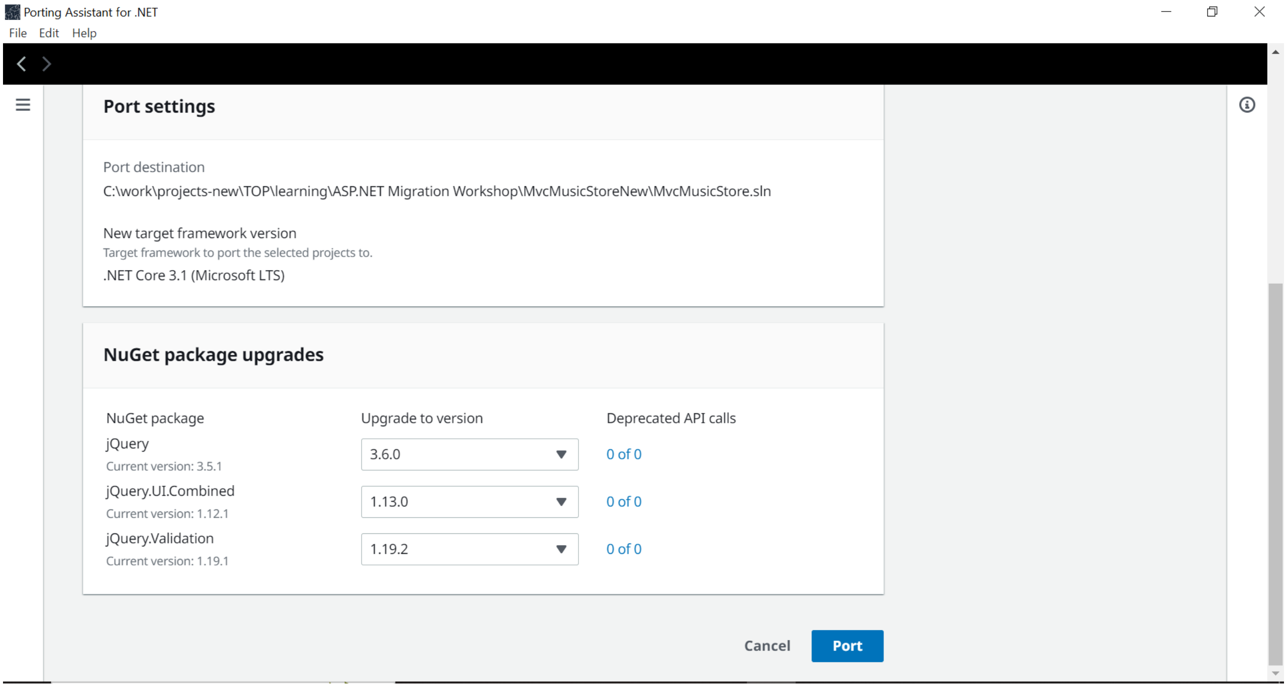
Port destination

C:\work\projects-new\TOP\learning\ASP.NET Migration Workshop\MvcMusicStoreNew\MvcMusicStore.sln

New target framework version

Target framework to port the selected projects to.

.NET Core 3.1 (Microsoft LTS)



Port settings

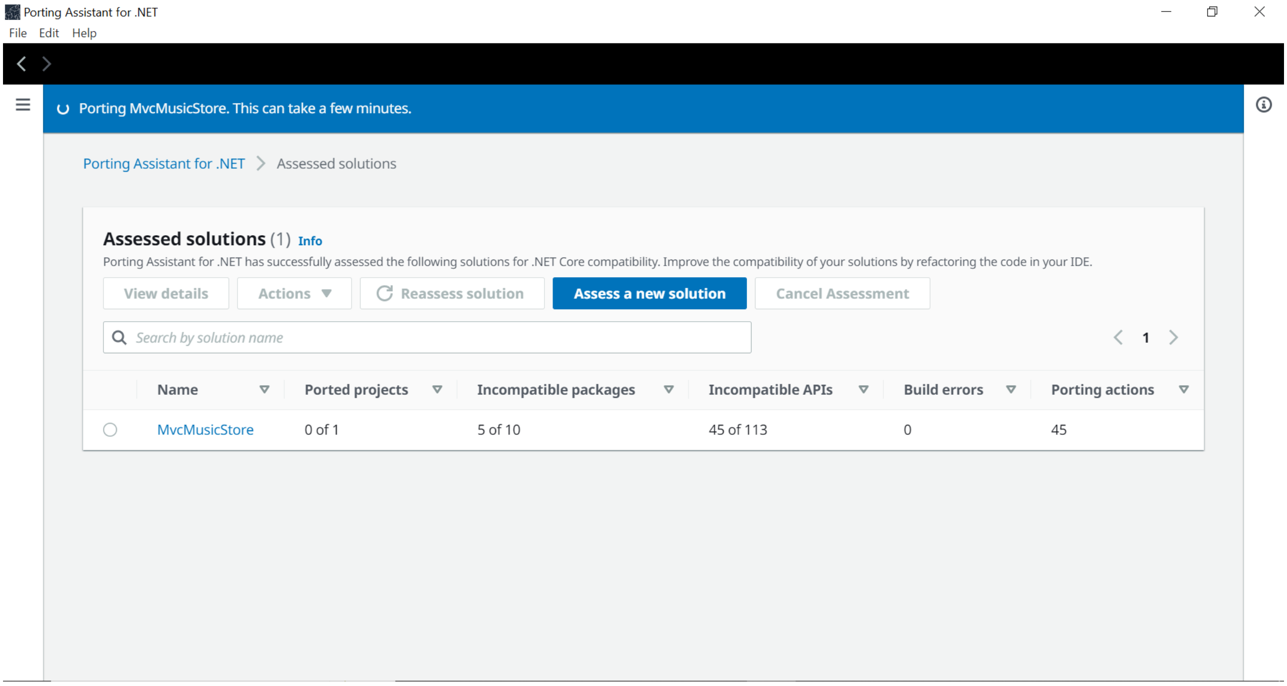
Port destination
C:\work\projects-new\TOP\learning\ASP.NET Migration Workshop\MvcMusicStoreNew\MvcMusicStore.sln

New target framework version
Target framework to port the selected projects to.
.NET Core 3.1 (Microsoft LTS)

NuGet package upgrades

NuGet package	Upgrade to version	Deprecated API calls
jQuery Current version: 3.5.1	3.6.0	0 of 0
jQuery.UI.Combined Current version: 1.12.1	1.13.0	0 of 0
jQuery.Validation Current version: 1.19.1	1.19.2	0 of 0

- Then the porting Assistant will start porting your solution automatically



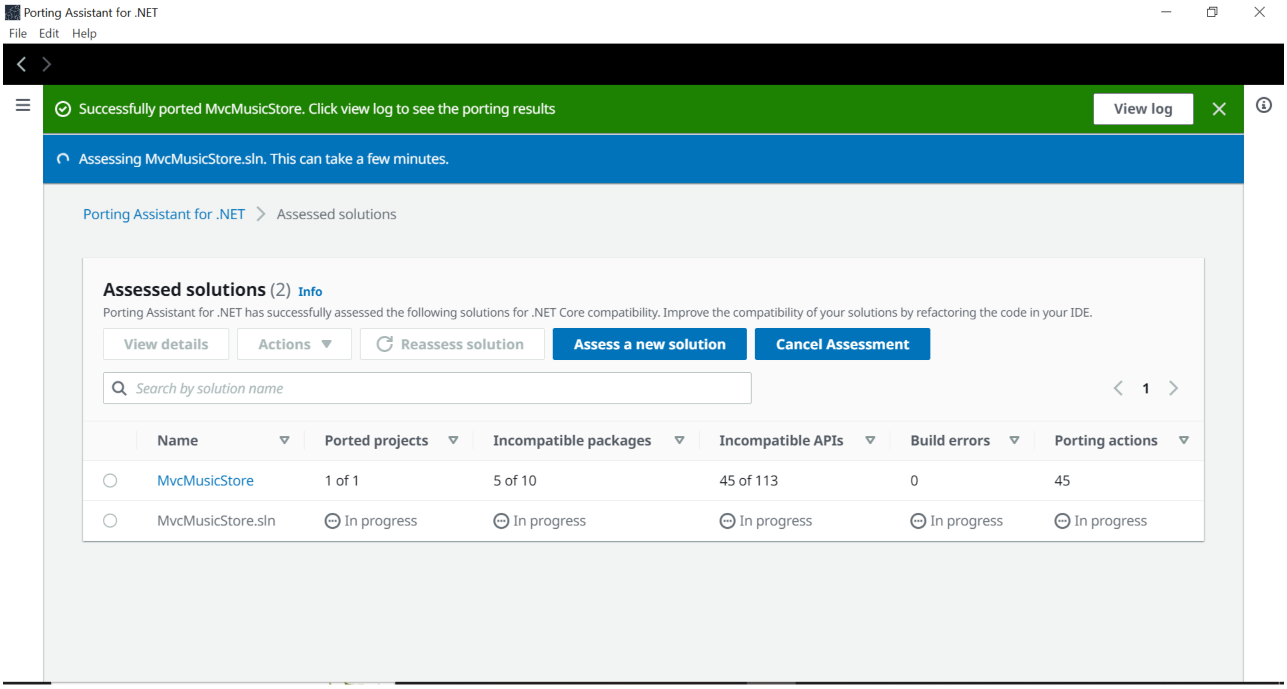
Porting MvcMusicStore. This can take a few minutes.

Porting Assistant for .NET > Assessed solutions

Assessed solutions (1) Info
Porting Assistant for .NET has successfully assessed the following solutions for .NET Core compatibility. Improve the compatibility of your solutions by refactoring the code in your IDE.

	Name	Ported projects	Incompatible packages	Incompatible APIs	Build errors	Porting actions
○	MvcMusicStore	0 of 1	5 of 10	45 of 113	0	45

- After Porting is completed , it will automatically start assessing the ported solution and you will see the ported solution in the `Assessed Solutions`



Successfully ported MvcMusicStore. Click view log to see the porting results

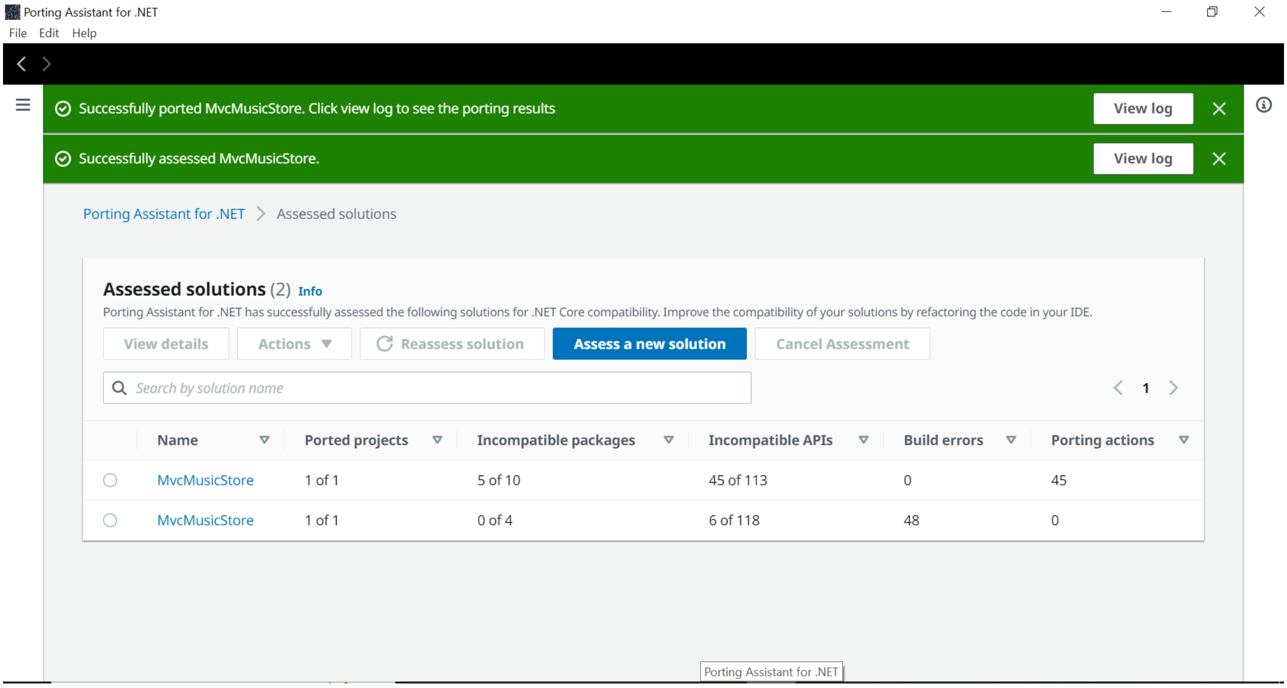
Assessing MvcMusicStore.sln. This can take a few minutes.

Assessed solutions (2)

Porting Assistant for .NET has successfully assessed the following solutions for .NET Core compatibility. Improve the compatibility of your solutions by refactoring the code in your IDE.

	Name	Ported projects	Incompatible packages	Incompatible APIs	Build errors	Porting actions
○	MvcMusicStore	1 of 1	5 of 10	45 of 113	0	45
○	MvcMusicStore.sln	In progress	In progress	In progress	In progress	In progress

- Wait for some time till the ported solution is fully assessed



Successfully ported MvcMusicStore. Click view log to see the porting results

Successfully assessed MvcMusicStore.

Assessed solutions (2)

Porting Assistant for .NET has successfully assessed the following solutions for .NET Core compatibility. Improve the compatibility of your solutions by refactoring the code in your IDE.

	Name	Ported projects	Incompatible packages	Incompatible APIs	Build errors	Porting actions
○	MvcMusicStore	1 of 1	5 of 10	45 of 113	0	45
○	MvcMusicStore	1 of 1	0 of 4	6 of 118	48	0

- As you could see the Porting Assistant has already helped in porting most of the incompatibilities but not all of them ,we still need some manual actions to complete porting the app and you could use the Porting Assistant to locate the rest of incompatibilities.
- You can get more on the needed manual porting actions for this app by checking the ASP.NET Migration Workshop

Resources

- Porting Assistant for .NET Documentation
- Port .NET applications from .NET Framework to .NET Core | AWS Events
- Porting Assistant Prerequisites