



Web API Token Based Authentication

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Gaurav Karroy

Date Jan 08, 2021

300.1k

26

22



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Introduction

In this article, we will learn how to implement Token Based Authentication in Web APIs to secure the data.

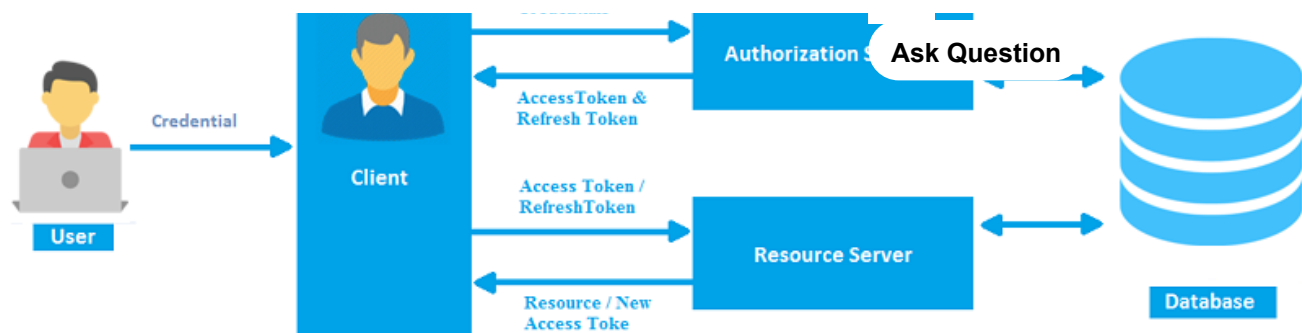
There are 4 common methods of Web API Authentication:

1. HTTP Authentication Schemes (Basic & Bearer)
2. API Keys
3. OAuth (2.0)
4. OpenID Connect

Here we will learn OAuth authentication. OAuth is an open standard for token based authentication and authorization on internet. By using OAuth we can create Token Based Authentication API.

What is Token Based Authentication in Web API?

Token-based authentication is a process where the client application first sends a request to Authentication server with a valid credentials. The Authentication server sends an Access token to the client as a response. This token contains enough data to identify a particular user and it has an expiry time. The client application then uses the token to access the restricted resources in the next requests until the token is valid. If the Access token is expired, then the client application can request for a new access token by using Refresh token.



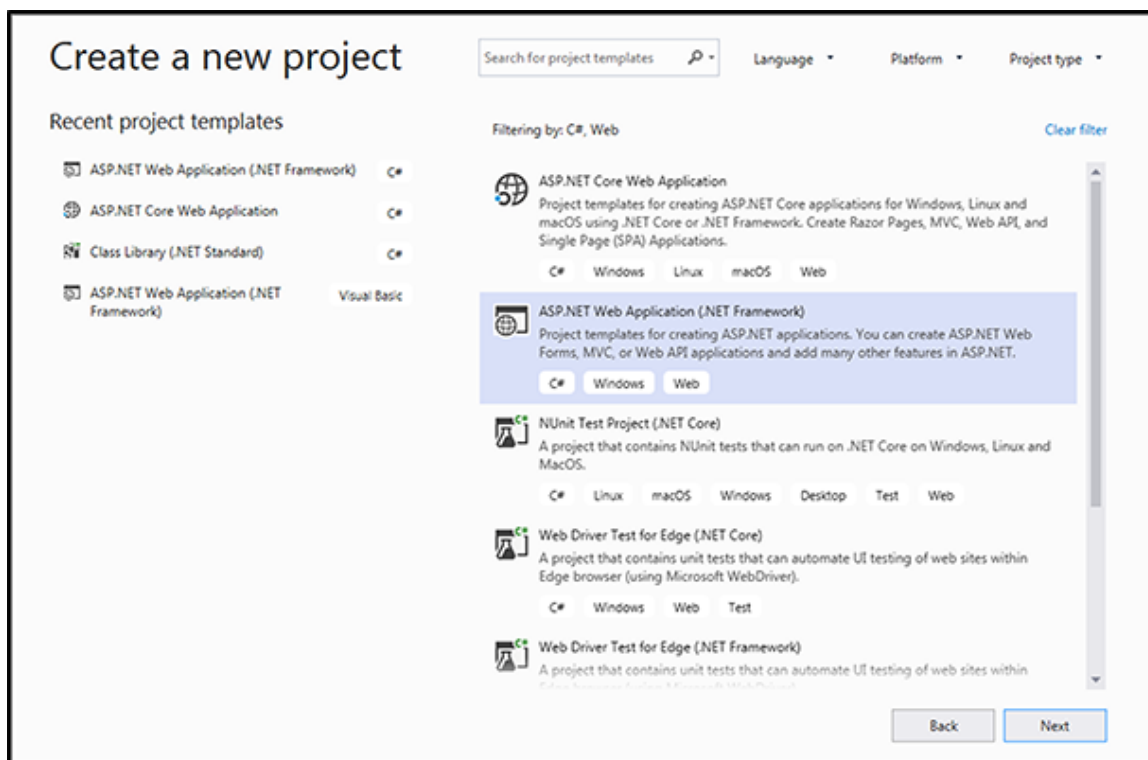
Advantages of Token Based Authentication

- Scalability of Servers
- Loosely Coupling
- Mobile-Friendly

Let's discuss the step by step procedure to create Token-Based Authentication,

Step 1 - Create ASP.NET Web Project in Visual Studio 2019

We have to create web project in Visual Studio as given in the below image. Choose ASP.Net Web Application from the menu.



Give the project name as:WEBAPITOKENAUTHENTICATION.

ASP.NET Web Application (.NET Framework) C# Windows Web

Project name

WEBAPITOKENAUTHENTICATION

Location

D:\study\Article\API Authentication\

Solution name ⓘ

WEBAPITOKENAUTHENTICATION

☐ Place solution and project in the same directory

Framework

.NET Framework 4.7.2

Back Create

Now choose the empty template and check the "MVC" and "Web API" on the right hand side.

Create a new ASP.NET Web Application

Empty
An empty project template for creating ASP.NET applications. This template does not have any content in it.

Web Forms
A project template for creating ASP.NET Web Forms applications. ASP.NET Web Forms lets you build dynamic websites using a familiar drag-and-drop, event-driven model. A design surface and hundreds of controls and components let you rapidly build sophisticated, powerful UI-driven sites with data access.

MVC
A project template for creating ASP.NET MVC applications. ASP.NET MVC allows you to build applications using the Model-View-Controller architecture. ASP.NET MVC includes many features that enable fast, test-driven development for creating applications that use the latest standards.

Web API
A project template for creating RESTful HTTP services that can reach a broad range of clients including browsers and mobile devices.

Single Page Application
A project template for creating rich client side JavaScript driven HTML5 applications using ASP.NET Web API. Single Page Applications provide a rich user experience which includes client-side interactions using HTML5, CSS3, and JavaScript.

Authentication
No Authentication
[Change](#)

Add folders & core references

☐ Web Forms
☒ MVC
☒ Web API

Advanced

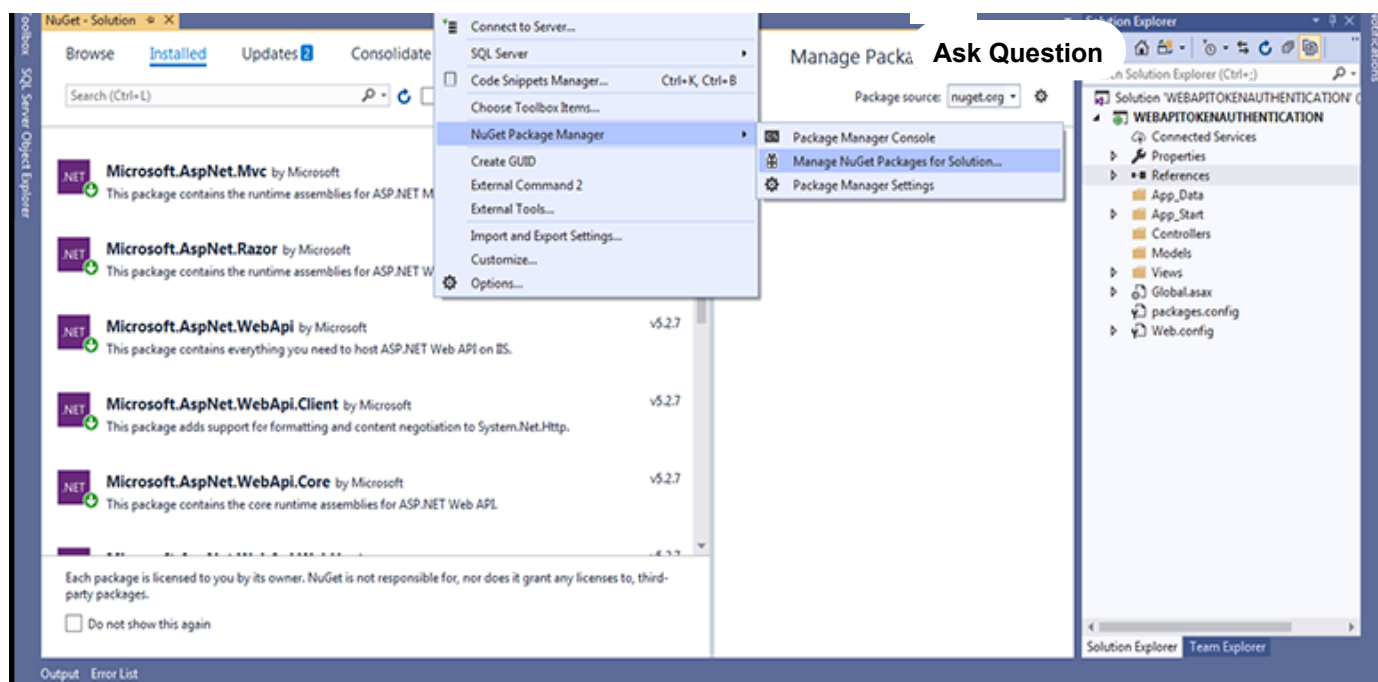
☒ Configure for HTTPS
☐ Docker support
(Requires [Docker Desktop](#))
☐ Also create a project for unit tests

WEBAPITOKENAUTHENTICATION.Tests

Back Create

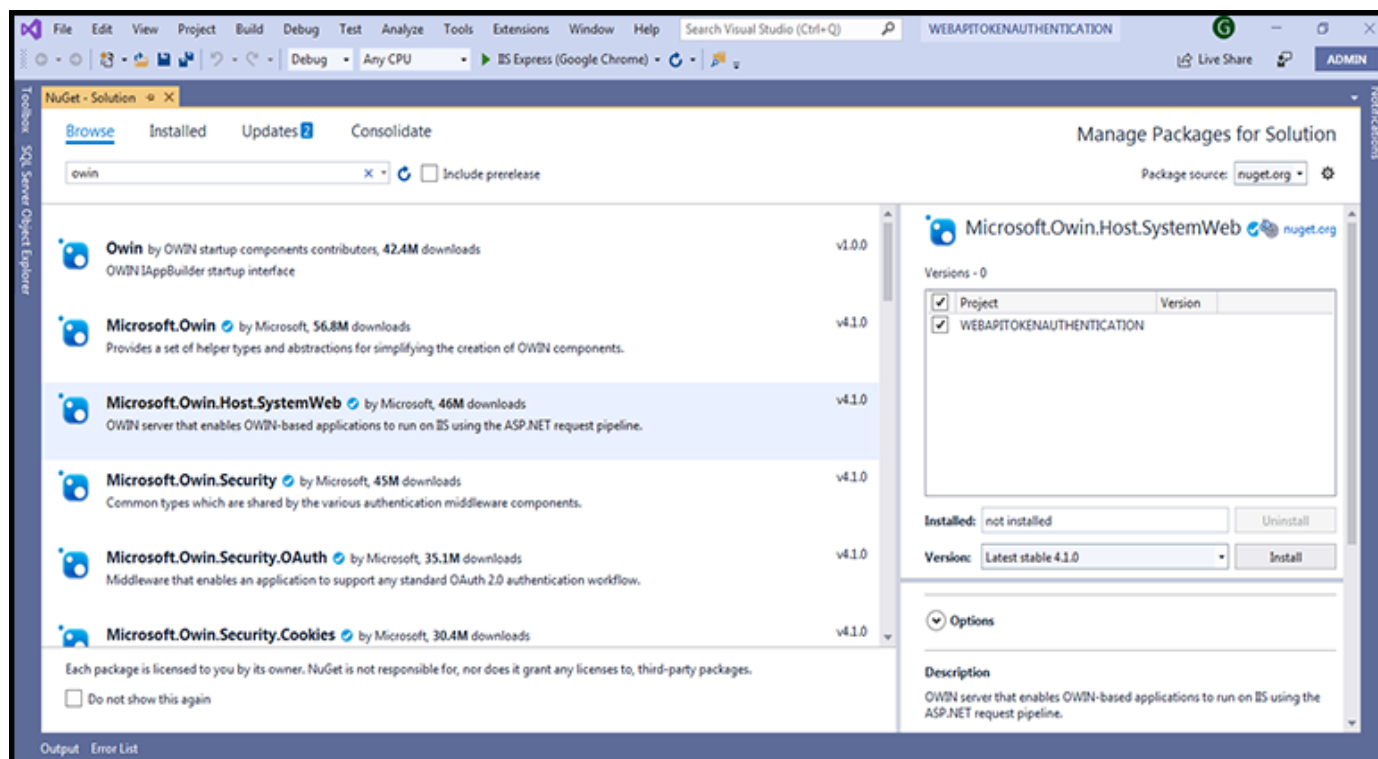
Step 2 - Addition Of References

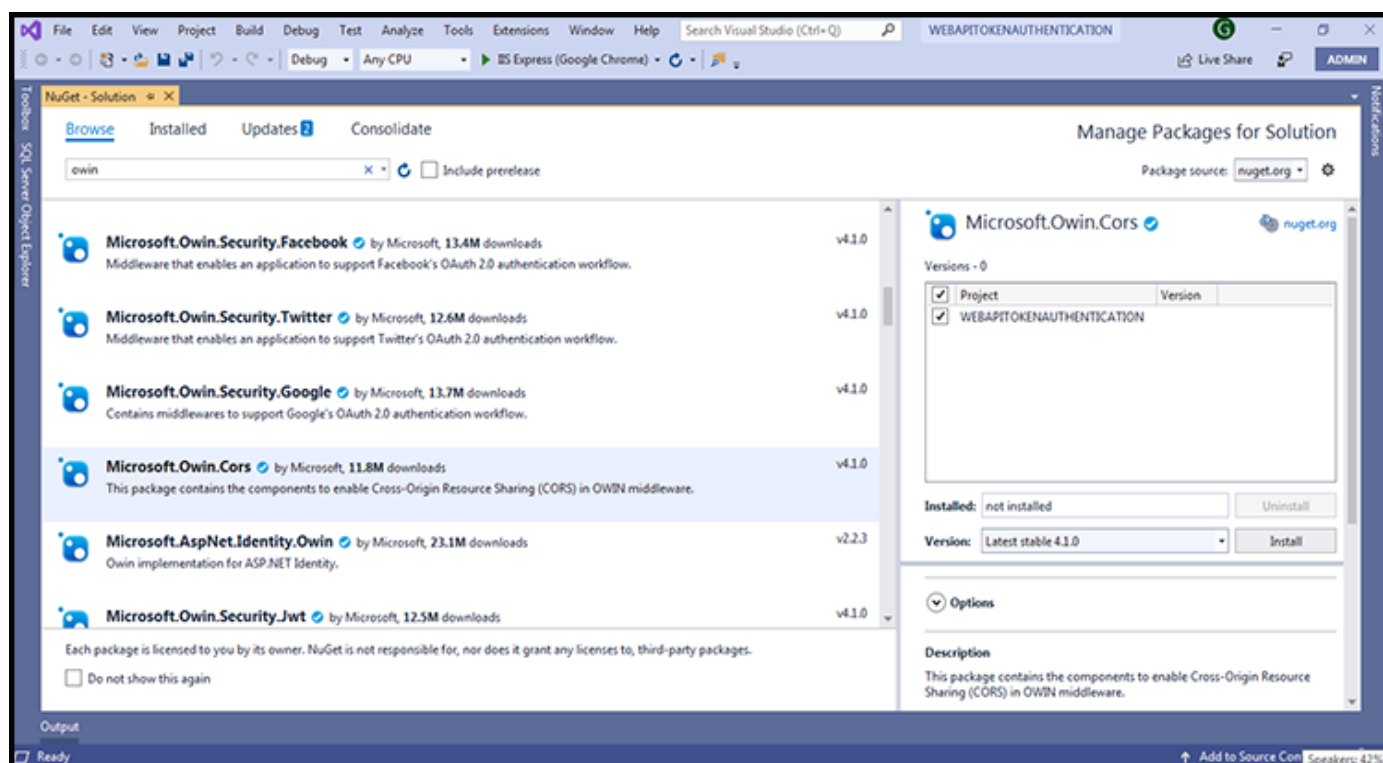
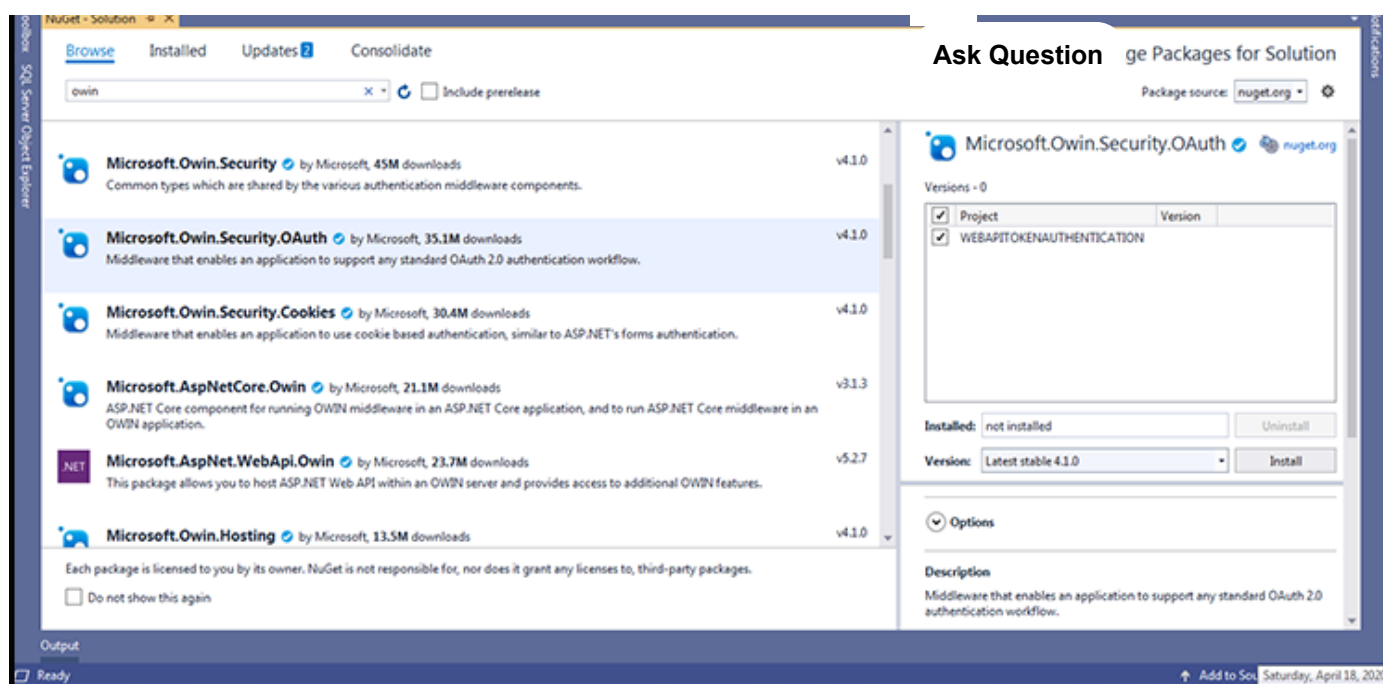
In this step, we have to add Nuget References like the below image,



Here we have to add the following references :

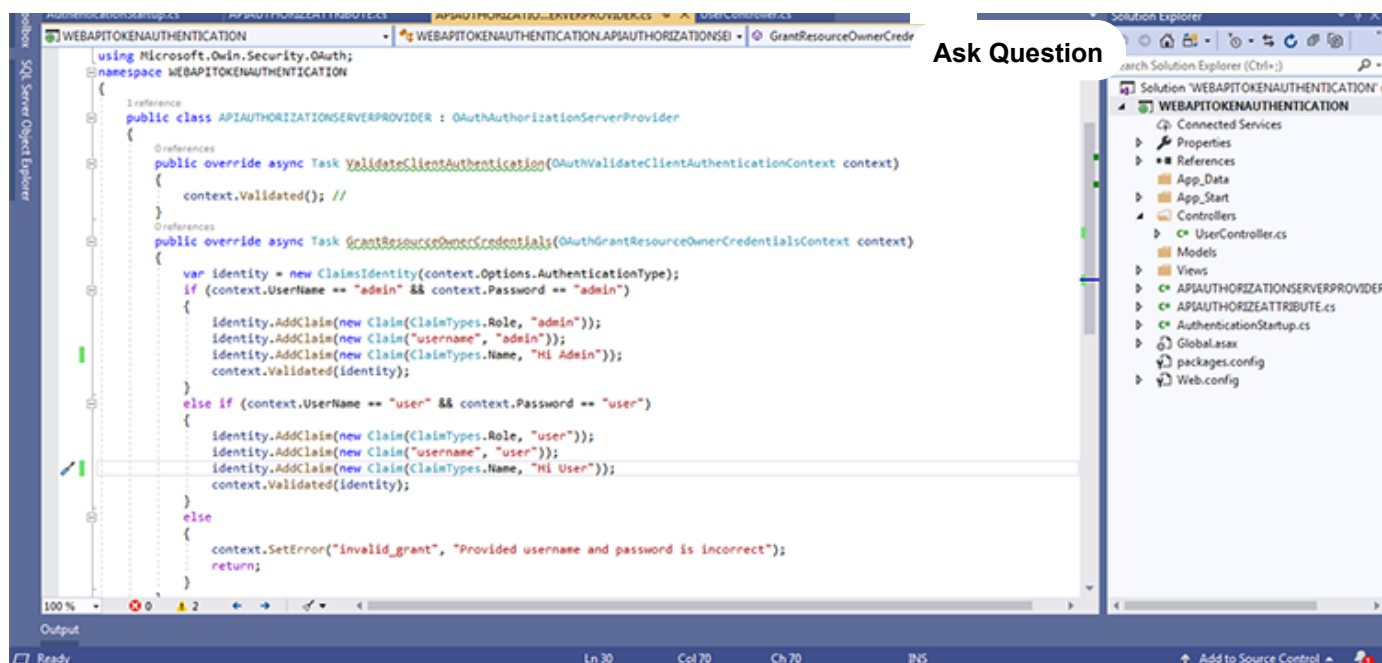
- Microsoft.Owin.Host.SystemWeb
- Microsoft.Owin.Security.OAuth
- Microsoft.Owin.Cors





Step 3 - Create APIAUTHORIZATIONSERVERPROVIDER.cs Class File

Now, let's create the class file to provide credentials to access data depending on username, password, and roles.



Ask Question

Code is given below:

```

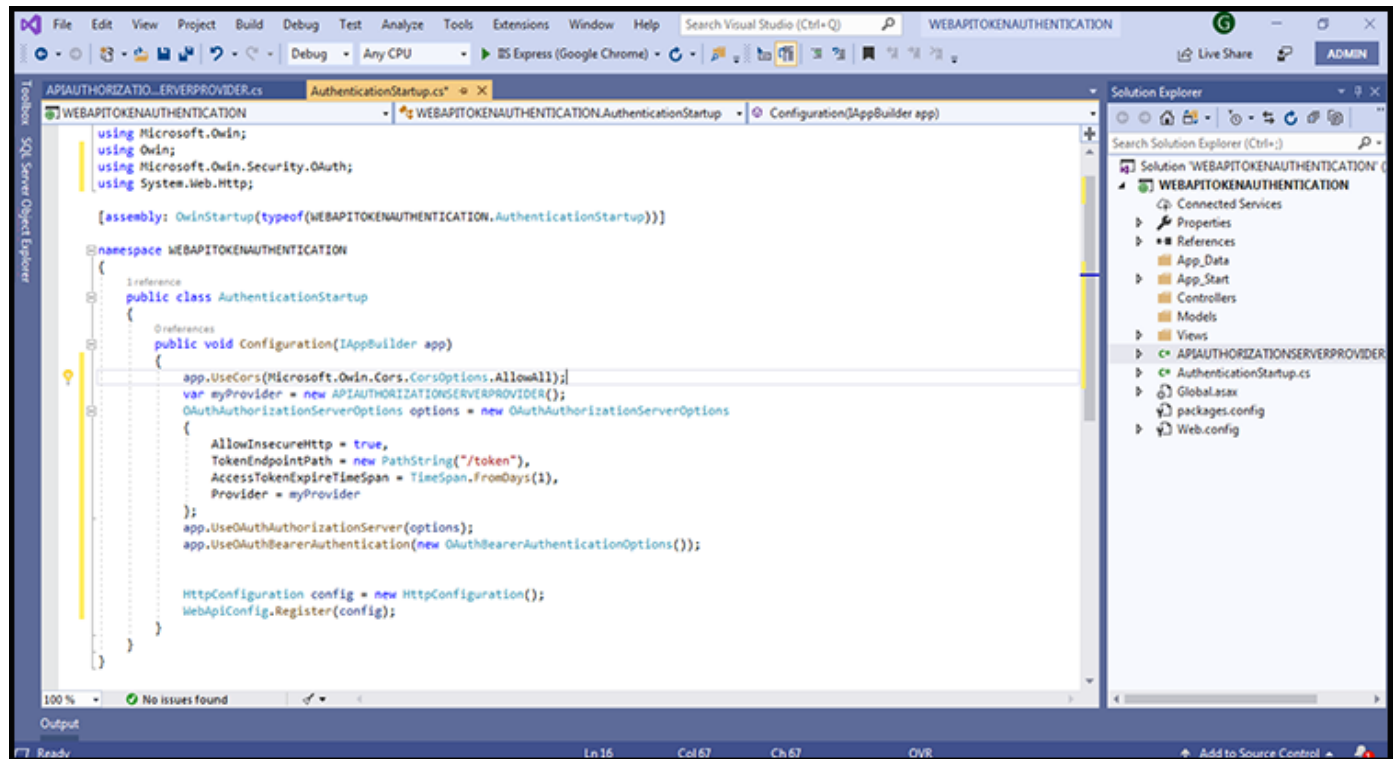
01. public class APIAUTHORIZATIONSERVERPROVIDER : OAuthAuthorizationServerProvid
02. {
03.     public override async Task ValidateClientAuthentication(OAuthValidateCli
04.     {
05.         context.Validated(); //
06.     }
07.     public override async Task GrantResourceOwnerCredentials(OAuthGrantResou
08.     {
09.         var identity = new ClaimsIdentity(context.Options.AuthenticationType);
10.         if (context.UserName == "admin" && context.Password == "admin")
11.         {
12.             identity.AddClaim(new Claim(ClaimTypes.Role, "admin"));
13.             identity.AddClaim(new Claim("username", "admin"));
14.             identity.AddClaim(new Claim(ClaimTypes.Name, "Hi Admin"));
15.             context.Validated(identity);
16.         }
17.         else if (context.UserName == "user" && context.Password == "user")
18.         {
19.             identity.AddClaim(new Claim(ClaimTypes.Role, "user"));
20.             identity.AddClaim(new Claim("username", "user"));
21.             identity.AddClaim(new Claim(ClaimTypes.Name, "Hi User"));
22.             context.Validated(identity);
23.         }
24.         else
25.         {
26.             context.SetError("invalid_grant", "Provided username and password is incorre
27.             return;
28.         }
29.     }

```


Step 4 - Create a AuthenticationStartup.cs Class File

Ask Question

Here, we need to create a new class file to implement the code configuration provider and create an instance of class APIAUTHORIZATIONSERVERPROVIDER.



Code is given below:

```

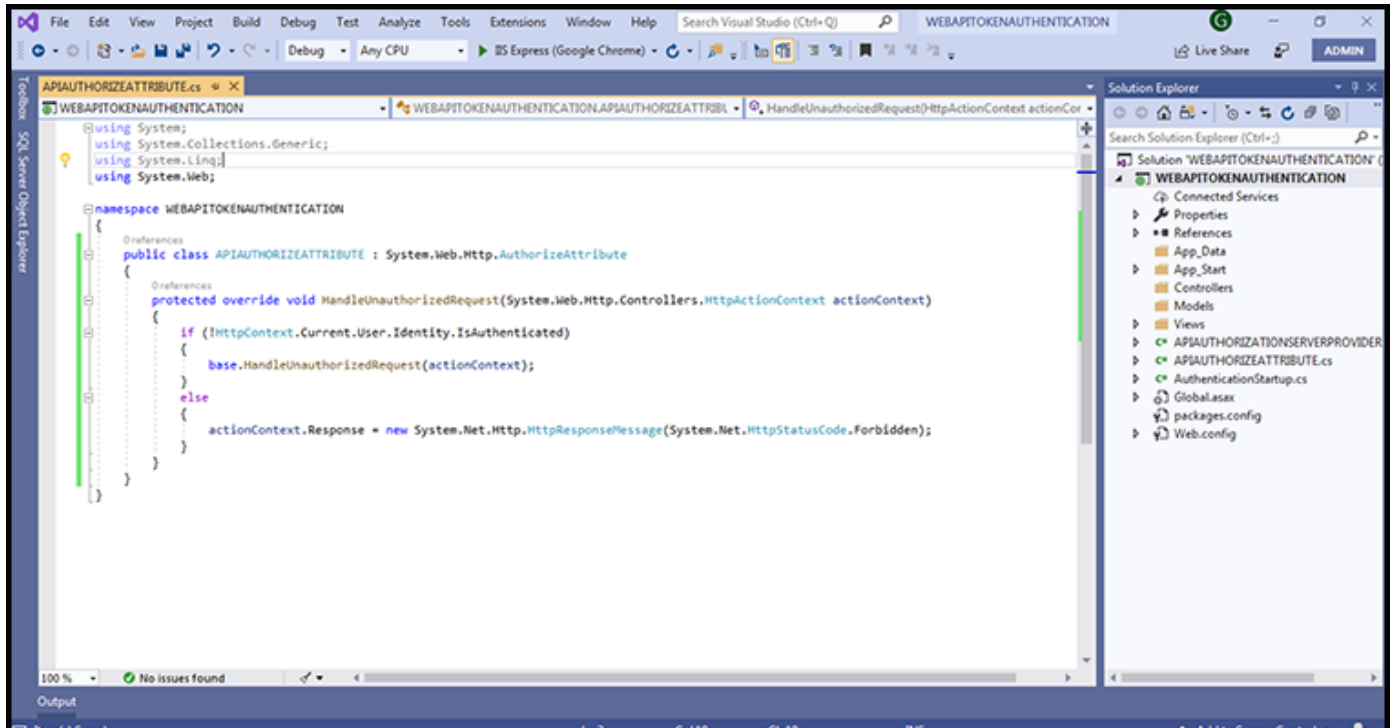
01. public class AuthenticationStartup
02. {
03.     public void Configuration(IAppBuilder app)
04.     {
05.         app.UseCors(Microsoft.Owin.Cors.CorsOptions.AllowAll);
06.         var myProvider = new APIAUTHORIZATIONSERVERPROVIDER();
07.         OAuthAuthorizationServerOptions options = new OAuthAuthorizationServerOptions
08.         {
09.             AllowInsecureHttp = true,
10.             TokenEndpointPath = new PathString("/token"),
11.             AccessTokenExpireTimeSpan = TimeSpan.FromDays(1),
12.             Provider = myProvider
13.         };
14.         app.UseOAuthAuthorizationServer(options);
15.         app.UseOAuthBearerAuthentication(new OAuthBearerAuthenticationOptions());
16.         HttpConfiguration config = new HttpConfiguration();
17.         WebApiConfig.Register(config);
18.     }

```

Step 5 - Create a APIAUTHORIZEATTRIBUTE.cs Class File

Ask Question

We need to create this class to handle unauthorized access to resources and show the proper message.

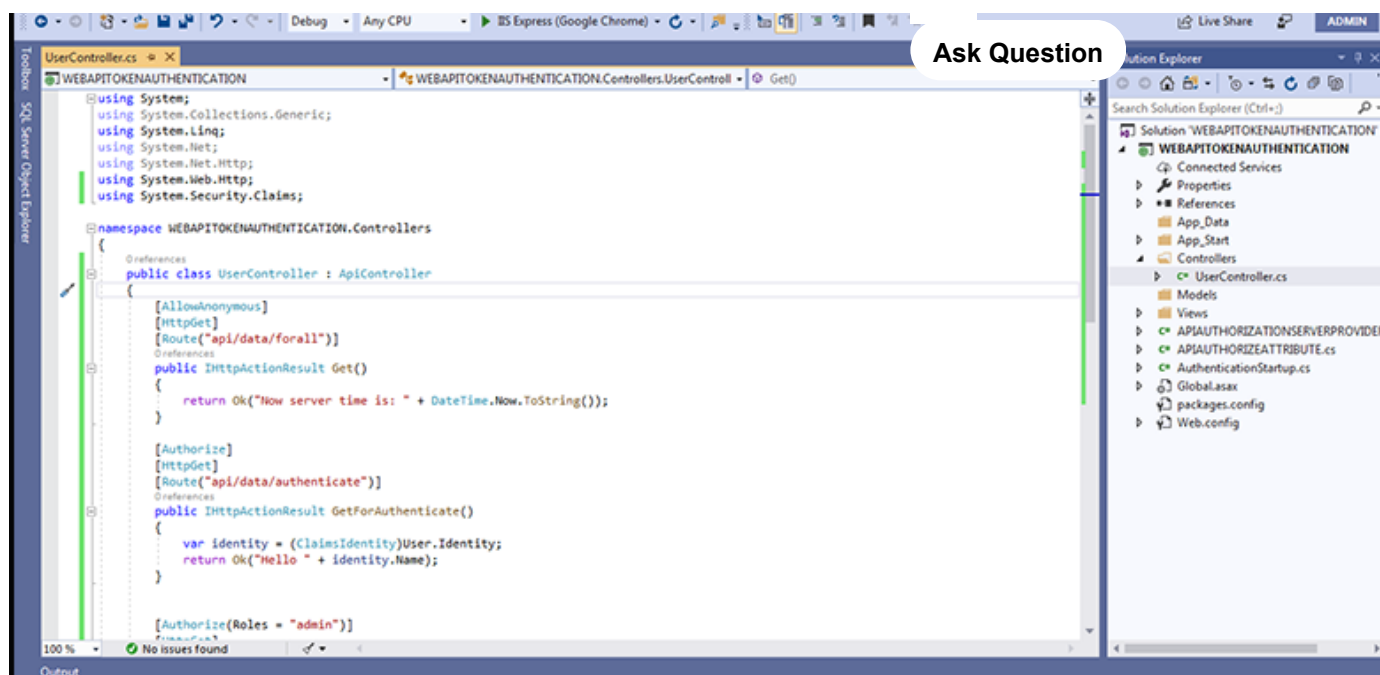


Code is given below:

```
01. public class APIAUTHORIZEATTRIBUTE : System.Web.Http.AuthorizeAttribute
02. {
03.     protected override void HandleUnauthorizedRequest(System.Web.Http.Contro
04.     {
05.         if (!HttpContext.Current.User.Identity.IsAuthenticated)
06.         {
07.             base.HandleUnauthorizedRequest(actionContext);
08.         }
09.         else
10.         {
11.             actionContext.Response = new System.Net.Http.HttpResponseMessage(System.Net.
12.         }
13.     }
14. }
```

Step 6 - Create a controller with name UserController

Now we have to create an empty web api controller with name usercontroller. In this controller we will write the actions with different authorization and roles.



Ask Question

The first action "Get" will be available for anonymous users .No authentication or token is needed for this.

```

01. [AllowAnonymous]
02. [HttpGet]
03. [Route("api/data/forall")]
04. public IHttpActionResult Get()
05. {
06.     return Ok("Now server time is: " + DateTime.Now.ToString());
07. }

```

The second action "GetForAuthenticate" only allows the authorized user to access it.

```

01. [Authorize]
02. [HttpGet]
03. [Route("api/data/authenticate")]
04. public IHttpActionResult GetForAuthenticate()
05. {
06.     var identity = (ClaimsIdentity)User.Identity;
07.     return Ok("Hello " + identity.Name);
08. }

```

The third action "GetForAdmin" checks authorization and allows only admins to access it.

```

01. [Authorize(Roles = "admin")]
02. [HttpGet]
03. [Route("api/data/authorize")]
04. public IHttpActionResult GetForAdmin()
05. {
06.     var identity = (ClaimsIdentity)User.Identity;
07.     var roles = identity.Claims

```

```

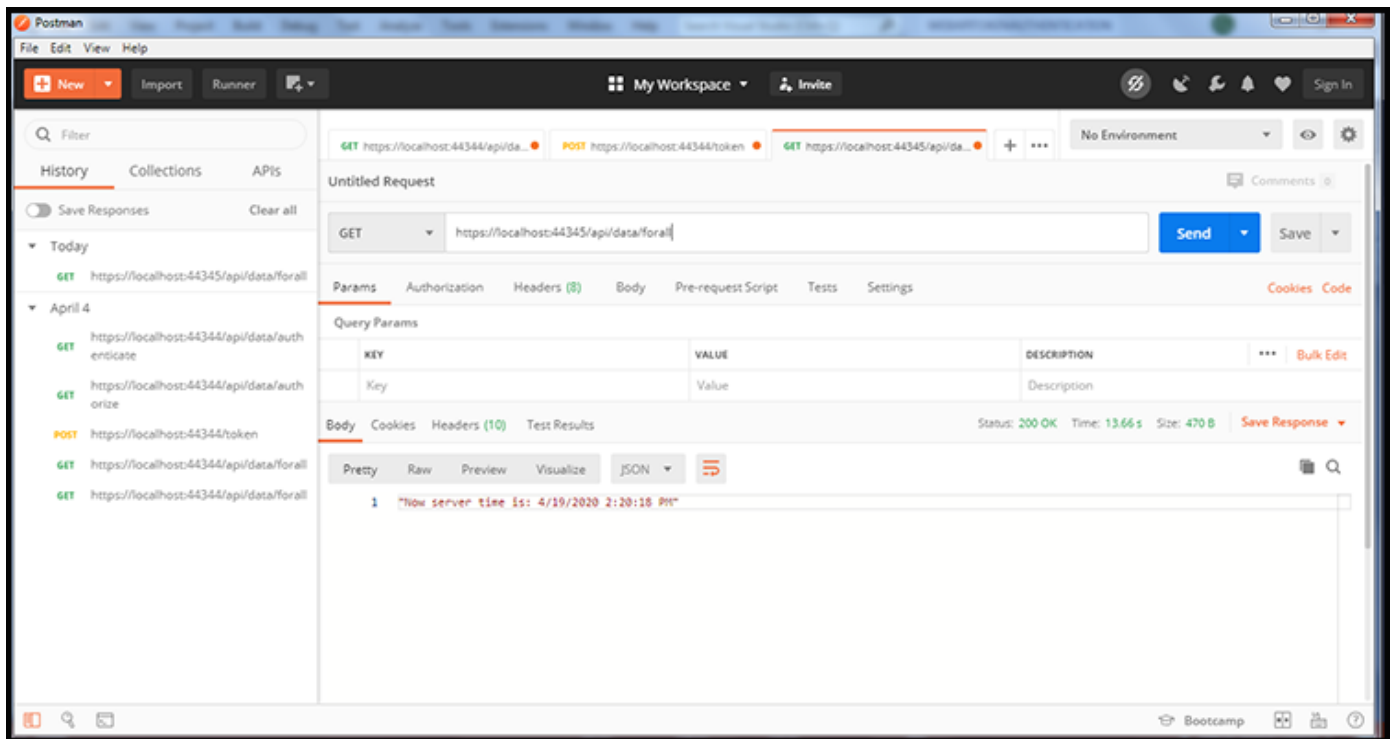
10. |         return OK("Hello " + identity.Name + " Role: " + String.Join(", ", roles));
11. |     }

```

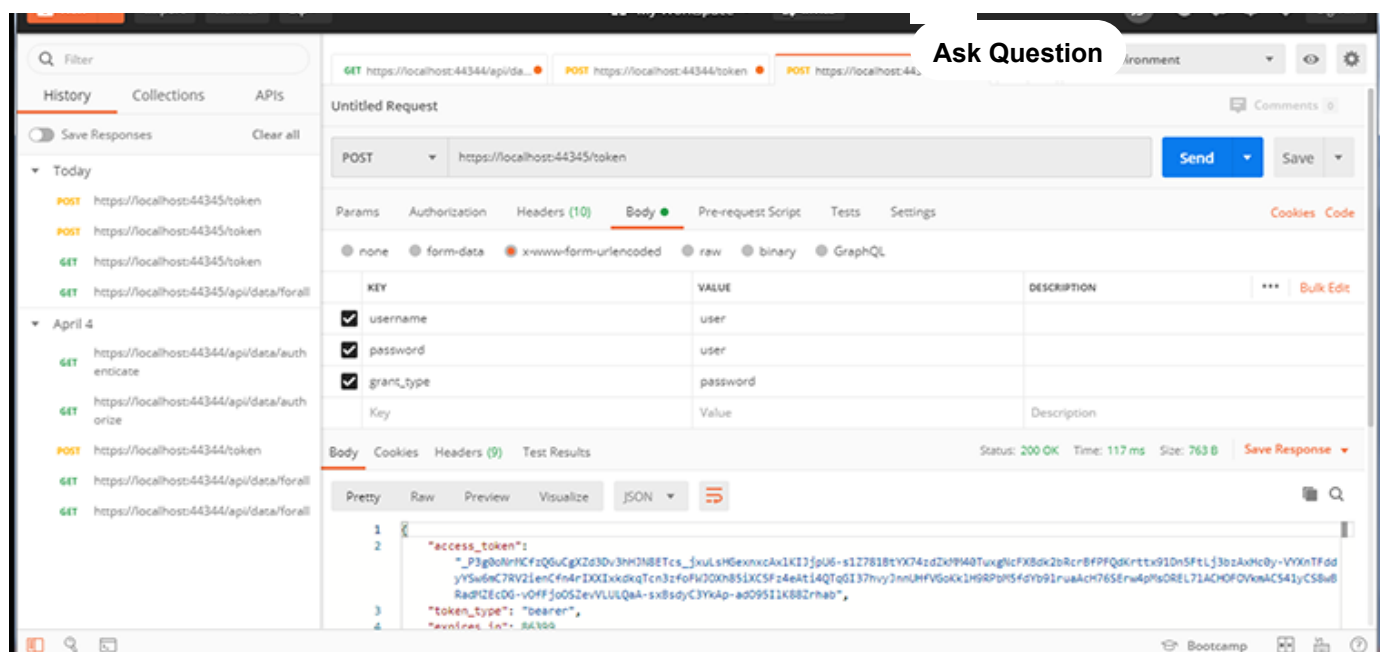
Ask Question

Step 7 - Accessing the controller using Postman

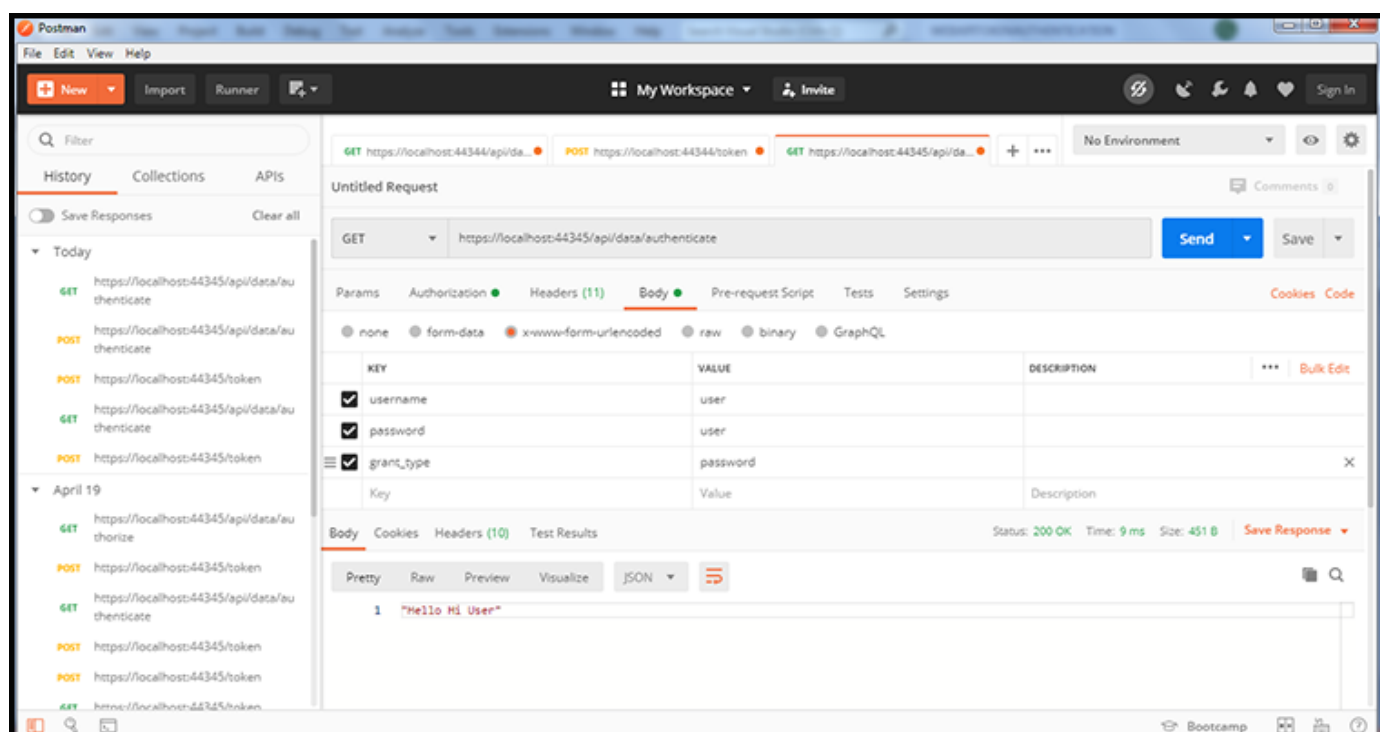
Now we have to access the controller. For that purpose, we are using postman to get data. In case of the first action "Get", we can access the data without generating a token as no authorization is needed for it, by just sending GET request for route "api/data/forall".



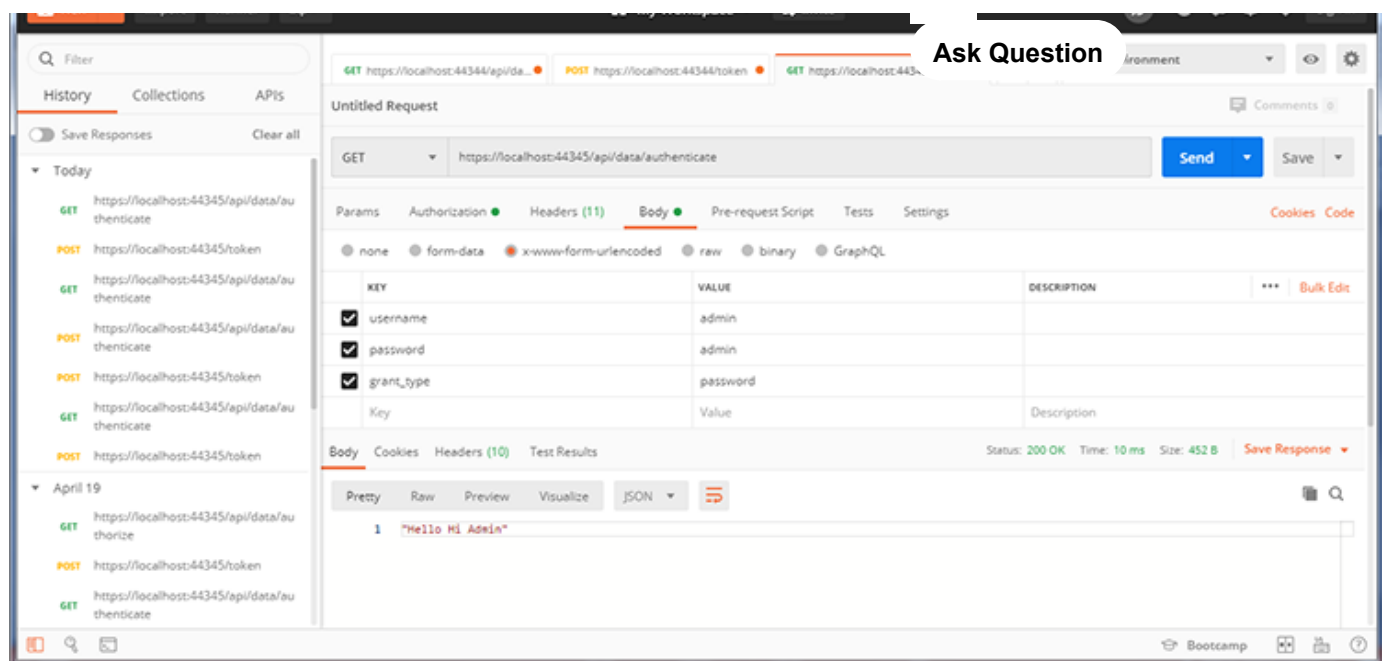
But for the rest of the actions, we have to generate a token using credentials. So we have to do post request for the token.



Now once the token is generated for the "user" now we can easily access the actions by using the user token.



Similarly, we can access the action as "admin" by generating token as admin and then using it.



Ask Question

In the same way, the other actions can be accessed by user or admin depending on the way the token is generated.

Authentication

Authorisation

OAUTH

OWIN

OWIN OAuth

Token

Web Api Token Authentication

OUR BOOKS



Gaurav Karroy

Working on Microsoft Technologies more than 5 years. Skilled in C#.NET, ASP.NET, MVC, Angular, ADO.NET, SQL Server, WebApi, Google Visualization API

2029

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22

20

Ask Question



Type your comment here and press Enter Key (Minimum 10 characters)



Hi I have this error, Server Error in '/' Application. The following errors occurred while attempting to load the app. - No assembly found containing an OwinStartupAttribute. - No assembly found containing a Startup or [AssemblyName].Startup class. To disable OWIN startup discovery, add the appSetting owin:AutomaticAppStartup with a value of "false" in your web.config. To specify the OWIN startup Assembly, Class, or Method, add the appSetting owin:AppStartup with the fully qualified startup class or configuration method name in your web.config. Description: An unhandled exception occurred during the execution of the current web request. Please review the stack trace for more information about the error and where it originated in the code. Exception Details:

System.EntryPointNotFoundException: The following errors occurred while attempting to load the app. - No assembly found containing an OwinStartupAttribute. - No assembly found containing a Startup or [AssemblyName].Startup class. To disable OWIN startup discovery, add the appSetting owin:AutomaticAppStartup with a value of "false" in your web.config. To specify the OWIN startup Assembly, Class, or Method, add the appSetting owin:AppStartup with the fully qualified startup class or configuration method name in your web.config. Source Error: An unhandled exception was generated during the execution of the current web request. Information regarding the origin and location of the exception can be identified using the exception stack trace below.

[Yogesh Shankar](#)

Nov 29, 2022

2127 27 0

0 0 Reply



I have the application working adding a sql server look-up in the GrantResourceOwnerCredentials method. How would I go about hosting the application so it can be accessed from the internet?

[Scott Thompson](#)

Oct 28, 2022

2056 98 0

0 0 Reply



Hai im facing this error config.Register(config); ==>('HttpConfiguration' does not contain a definition for 'Register' and no accessible extension method 'Register' accepting a first argument of type 'HttpConfiguration' could be found (are you missing a using directive or an assembly reference?) WEBAPITOKENAUTHENTICATION)

[siva kumar](#)

Jan 17, 2022

2075 79 0

0 1 Reply



Install-Package Microsoft.Net.Http

[ahmed mustafa](#)

Aug 24, 2022

1997 157 0

0



I have add the following lines in webapiconfig register method. Config.SuppressDefaultHostAuthentication(); config.Filters.Add(new HostAuthenticationFilter(OAuthDefaults.AuthenticationType)); but i have getting error message "No OWIN authentication manager is associated with the request". Can you please guide? Thanks

[jai seelan](#)

Dec 30, 2021

2129 25 0

0 0 Reply



config.Filters.Add(new HostAuthenticationFilter(OAuthDefaults.AuthenticationType)); Add following line before namespace in AuthenticationStartup.cs [assembly: **Ask Question**
OwinStartup(typeof(WEBAPITOKENAUTHENTICATION.AuthenticationStartup))]

[Kruti Dave](#)

2086 68 478

Nov 06, 2021

0 0 Reply



I am having the same issue....When i use /token in postman return: The resource cannot be found. Token URL not calling for unknown reason, when i can this URL on my local machine: http://localhost:1234/token. Can you please guide?

[David Smith](#)

2139 15 0

Oct 20, 2021

0 2 Reply



Add the following lines in webapiconfig register method.
Config.SuppressDefaultHostAuthentication(); config.Filters.Add(new HostAuthenticationFilter(OAuthDefaults.AuthenticationType)); Add following line before namespace in AuthenticationStartup.cs [assembly: OwinStartup(typeof(WEBAPITOKENAUTHENTICATION.AuthenticationStartup))]

[Kruti Dave](#)

2086 68 478

Nov 06, 2021

1



Add those lines and still doesn't work. 404 not found error when running in post man

[marty kin](#)

2138 16 0

Jun 02, 2022

0



When i use /token in postman return: The resource cannot be found. Token URL not calling for unknown reason, when i can this URL on my local machine: http://localhost:3244/token. Can you please guide?

[Zarqa Bukhari](#)

2123 31 0

Oct 20, 2021

0 1 Reply



For someone struggling still today change the config value to true instead of false as below
<add key="owin:AutomaticAppStartup" value="true"></add>

[Noorulla Khan](#)

2085 69 0

Nov 14, 2022

0



[Gaurav Karroy](#) Can we implement okta using the same?

[Shashank Sood](#)

2124 30 0

Oct 02, 2021

0 0 Reply



Very Good explanation !!!

[Ramdas Chavan](#)

2078 76 0

Aug 05, 2021

0 0 Reply



Thanks for this, I have one question can we revoke the access token?

[Vikram Singh](#)

2152 2 0

Jun 05, 2021

0 0 Reply

Ask Question

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