(T4)在不同的 origin 透過 Json、Padding 和 EnableCors(CrossOriginResourceSharing)的方式用 Ajax 呼叫 Api
CourseGUID 4c5822ff-7111-4e25-a336-ef18d48d54bd
==========
(T4)在不同的 origin 透過 Json、Padding 和 EnableCors(CrossOriginResourceSharing)的方式用 Ajax 呼叫 Api
(T4-1)自動生成 ApiController、MvcController。用 Ajax 呼叫 Api
(T4-2)討論 ApiController 的 Get、Put
(T4-3)討論 ApiController 的 Post、Delete
(T4-4)討論 MvcController
(T4-5)在相同的 origin 用 Ajax 呼叫 Api
(T4-6)討論在不同的 origin 用 Ajax 呼叫 Api 的問題
(T4-7)在不同的 origin 透過 Json、Padding 的方式用 Ajax 呼叫 Api
(T4-8)在不同的 origin 透過 EnableCors(CrossOriginResourceSharing)的方式用 Ajax 呼叫 Api
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---
7. OnlineGame.Mvc

==========

1. OnlineGame DB

The tutorial will discuss
Auto-generate the API with Get、Post、Put、Delete
and then Read, Insert, Update, Delete data from the database
About HttpGet、HttpPost、HttpPut、HttpDelete.
About FromBody and FromURI
Jquery AJAX call Web API in the different origins
JSONP(JSON with Padding) allows Jquery AJAX call Web API in the different origins
CORS (Cross Origin Resource Sharing) allows Jquery AJAX call Web API in the different origins
---
本堂課討論
建立一個 API with Get、Post、Put、Delete 並且 Read, Insert, Update, Delete data from the database。
關於 HttpGet、HttpPost、HttpPut、HttpDelete 四大屬性
關於 FromBody 和 FromURI
Jquery AJAX 呼叫 Web API 在相同的 origin
使用 JSONP (JSON with Padding)讓 Jquery AJAX 呼叫 Web API 在不同的 origin
使用 Enable CORS (Cross Origin Resource Sharing)讓 Jquery AJAX 呼叫 Web API 在不同的 origin

1.0. Some points

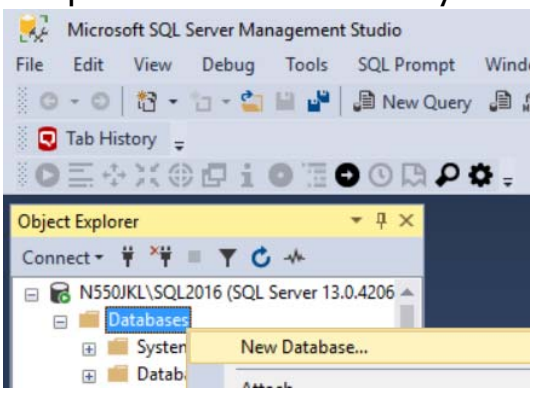
1.
Regular expression
https://regexr.com/
2.
Calling Stored Procedure from Entity Framework 6 Code First
http://www.dotnetodyssey.com/2015/03/12/calling-stored-procedure-from-entity-framework-6-code-first/

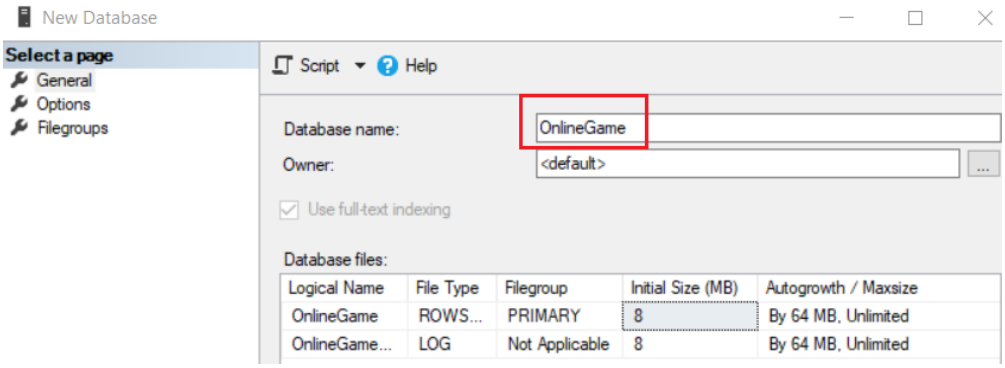
1.1. TSQL

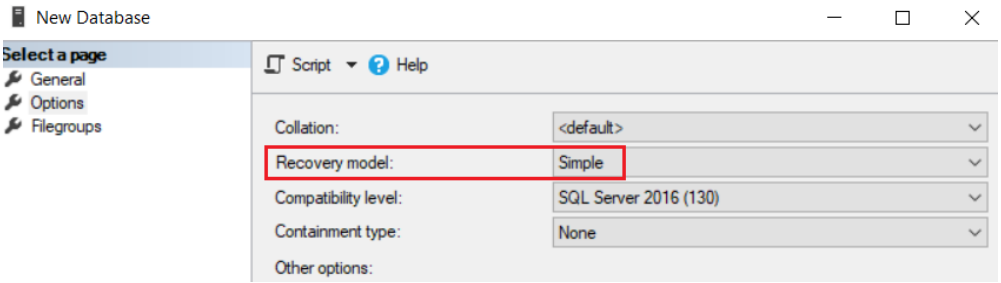
In SQL server Management Studio (SSMS)
Database --> Right Click --> New Database -->
In General Tab -->

Name: **OnlineGame**

In options Tab --> Recovery model : **Simple**





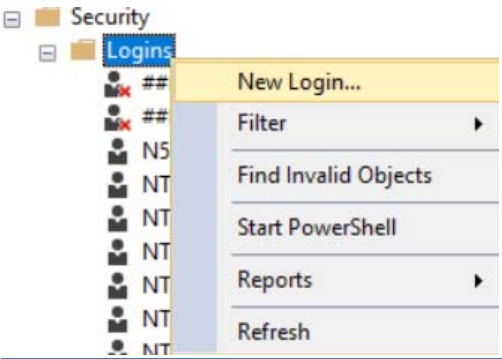


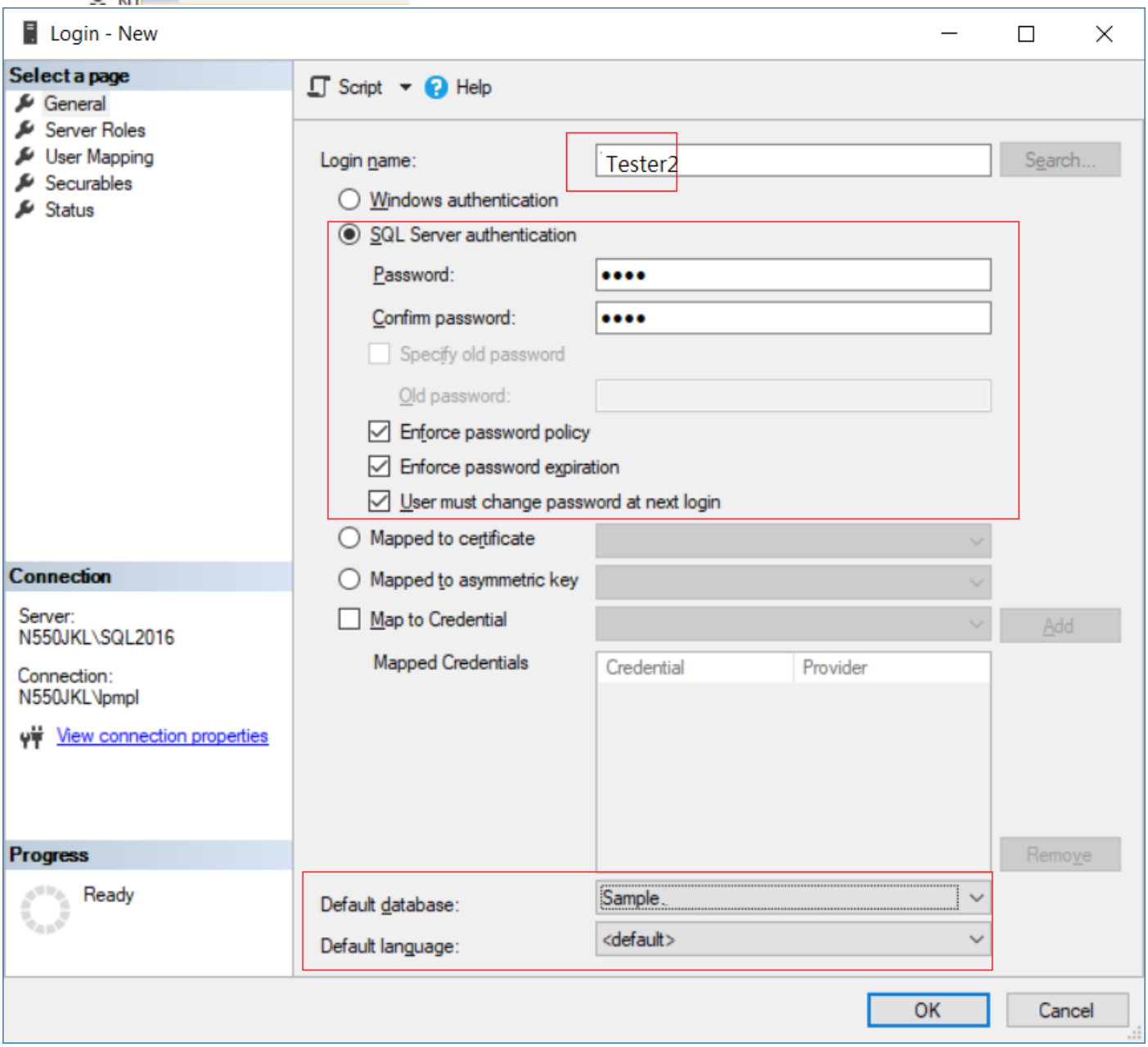

```
--1 -------------------------------------------------------
--Drop Table if it exists.
IF ( EXISTS ( SELECT     *
              FROM       INFORMATION_SCHEMA.TABLES
              WHERE      TABLE_NAME = 'Gamer' ) )
    BEGIN
        TRUNCATE TABLE Gamer;
        DROP TABLE Gamer;
    END;
GO -- Run the previous command and begins new batch
--2 -------------------------------------------------------
CREATE TABLE Gamer
    (
      Id INT PRIMARY KEY
             IDENTITY(1, 1)
             NOT NULL ,
      Name NVARCHAR(50) NOT NULL ,
      Gender NVARCHAR(50) NOT NULL ,
      Score INT NOT NULL ,
      GameMoney INT NOT NULL
```

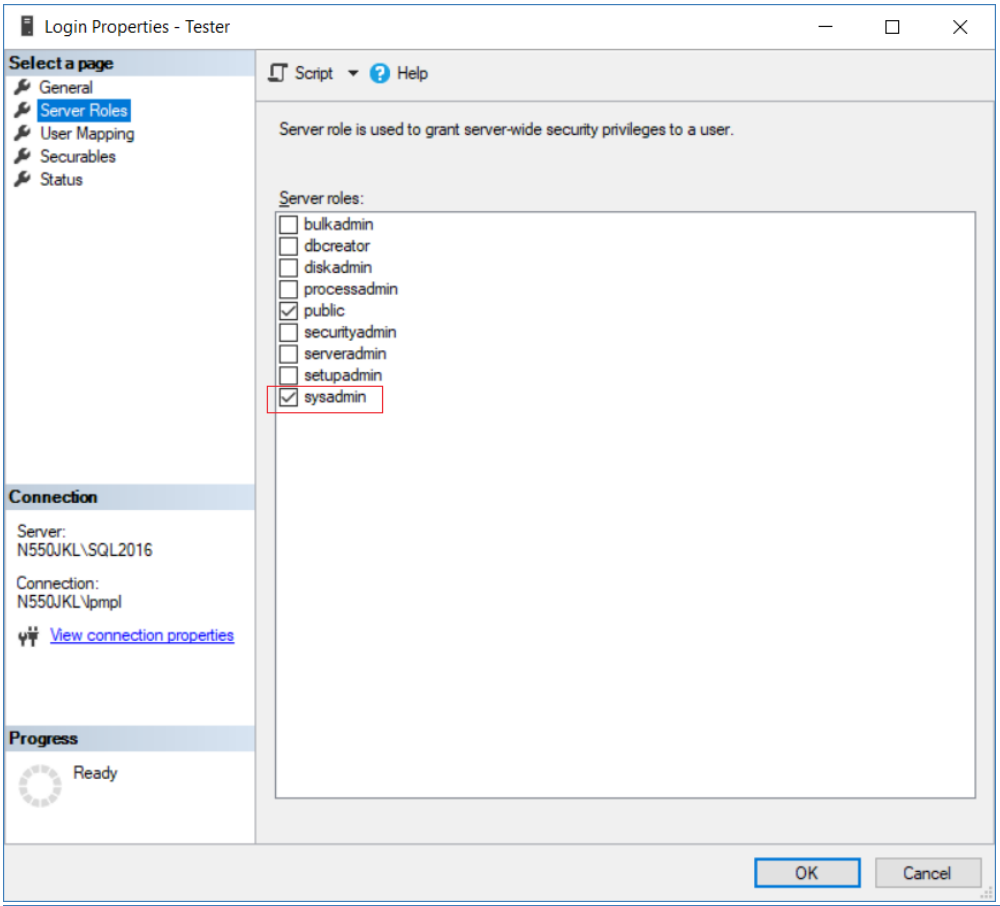
```sql
    );
GO -- Run the previous command and begins new batch
--3 -------------------------------------------------------
INSERT  INTO Gamer
VALUES  ( 'NameOne ABC', 'Male', 5000, 550 );
INSERT  INTO Gamer
VALUES  ( 'NameTwo ABCDE', 'Female', 4500, 1200 );
INSERT  INTO Gamer
VALUES  ( 'NameThree EFGH', 'Male', 6500, 3050 );
INSERT  INTO Gamer
VALUES  ( 'NameFour HIJKLMN', 'Female', 45000, 450 );
INSERT  INTO Gamer
VALUES  ( 'NameFive NOP', 'Male', 3000, 200 );
INSERT  INTO Gamer
VALUES  ( 'NameSix PQRSTUVW', 'Male', 4000, 700 );
INSERT  INTO Gamer
VALUES  ( 'NameSeven XYZ', 'Male', 450, 1500 );
GO -- Run the previous command and begins new batch
```

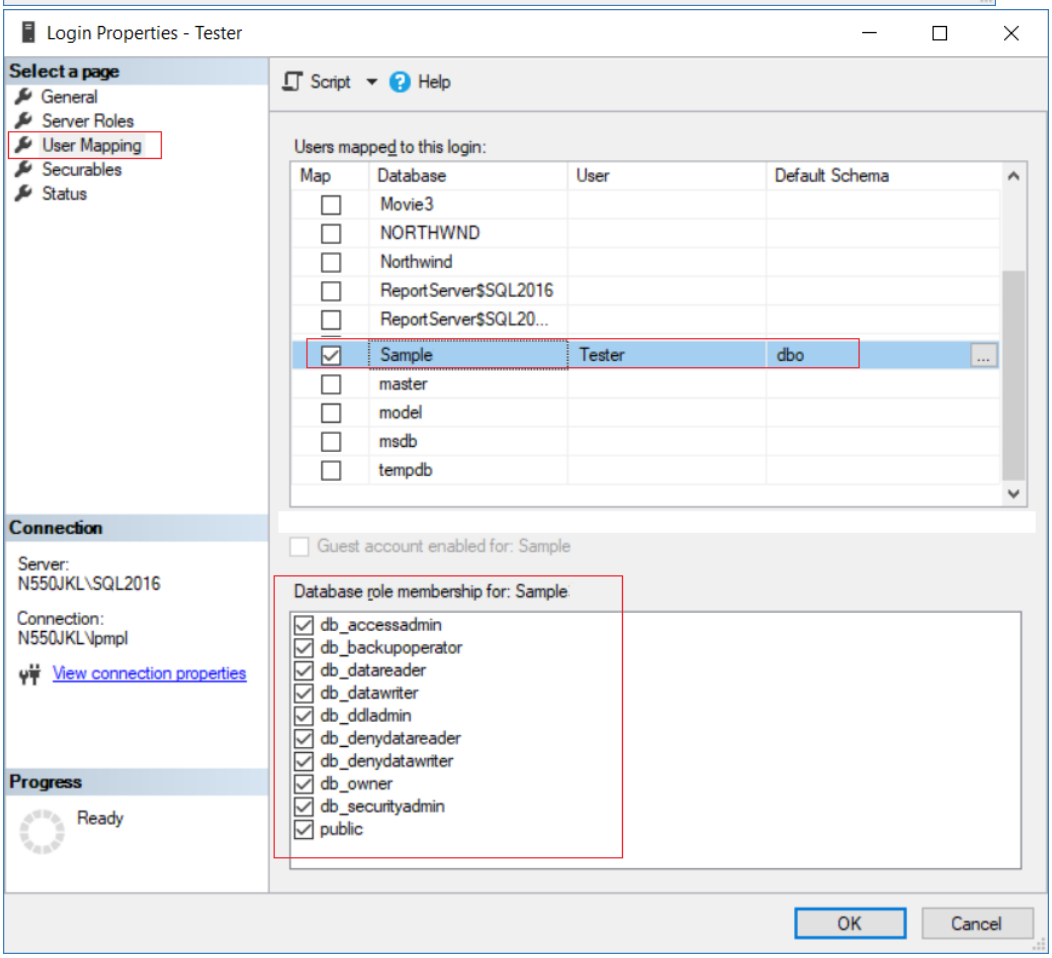
1.2. Security login

In SQL server
Object Explorer --> Security --> Logins --> New Logins
-->
General Tab
Login Name :
Tester2
Password:
1234
Default Database:
OnlineGame
-->
Server Roles Tab
Select
sysadmin
-->
User Mapping Tab
Select **OnlineGame**
Select every single role.


Security
Logins
New Login...
Filter
Find Invalid Objects
Start PowerShell
Reports
Refresh


Login - New
Select a page
General
Server Roles
User Mapping
Securables
Status
Script
Help
Login name:
Tester2
Search...
Windows authentication
SQL Server authentication
Password:
Confirm password:
Specify old password
Old password:
Enforce password policy
Enforce password expiration
User must change password at next login
Mapped to certificate
Mapped to asymmetric key
Map to Credential
Add
Mapped Credentials
Credential
Provider
Remove
Connection
Server:
N550JKL\SQL2016
Connection:
N550JKL\lpmpl
View connection properties
Progress
Ready
Default database:
Sample
Default language:
<default>
OK
Cancel





2. OnlineGame Solution

2.1. OnlineGame Solution

File --> New --> Project... -->

Other Project Types --> Visual Studio Solutions --> Blank Solution
-->

Name: **OnlineGame**

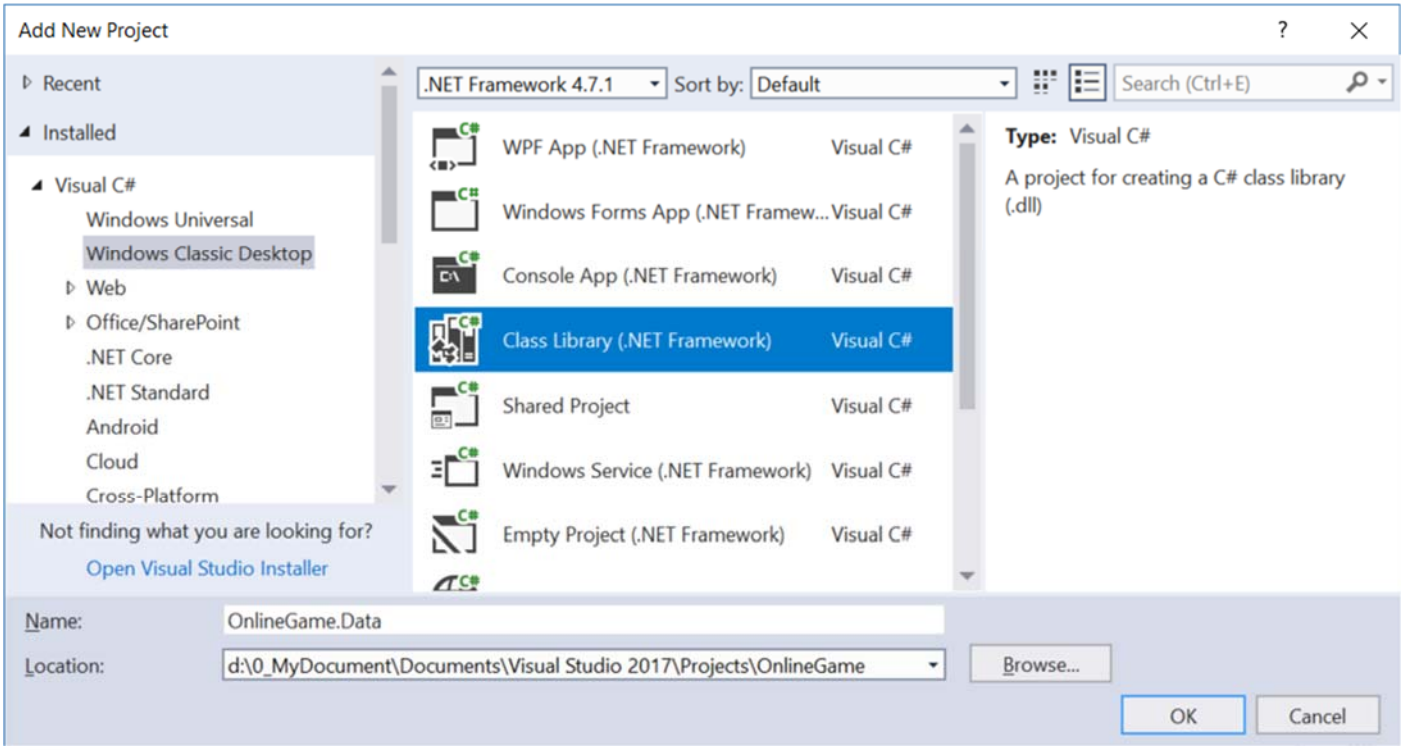
2.2. OnlineGame.Data

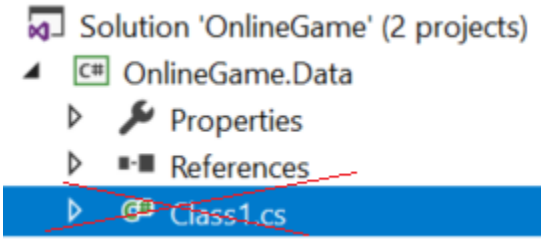
Solutions Name --> Add --> New Project -->

Visual C# --> **Class Library (.NET Framework)**
-->

Name:
OnlineGame.Data
-->

Delete Class1.cs





2.3. OnlineGame.WebApi

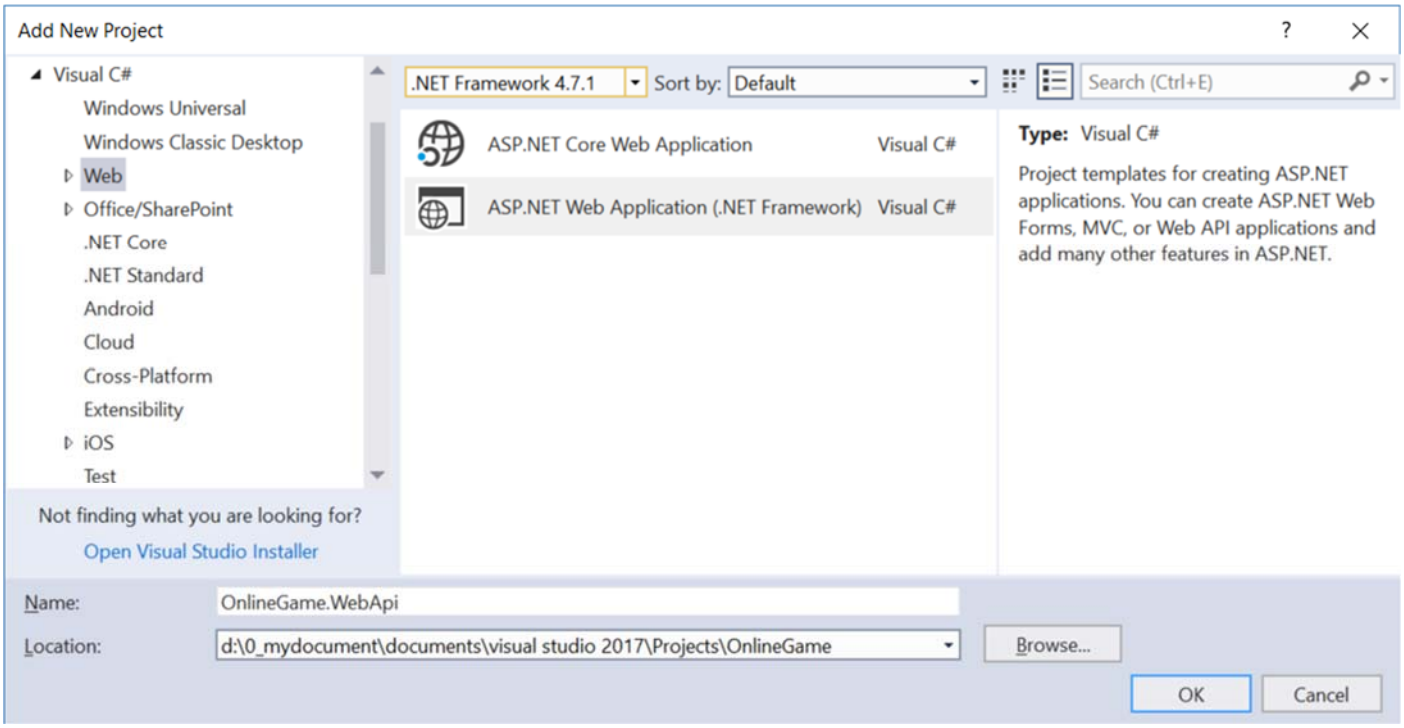
Solutions Name --> Add --> New Project -->

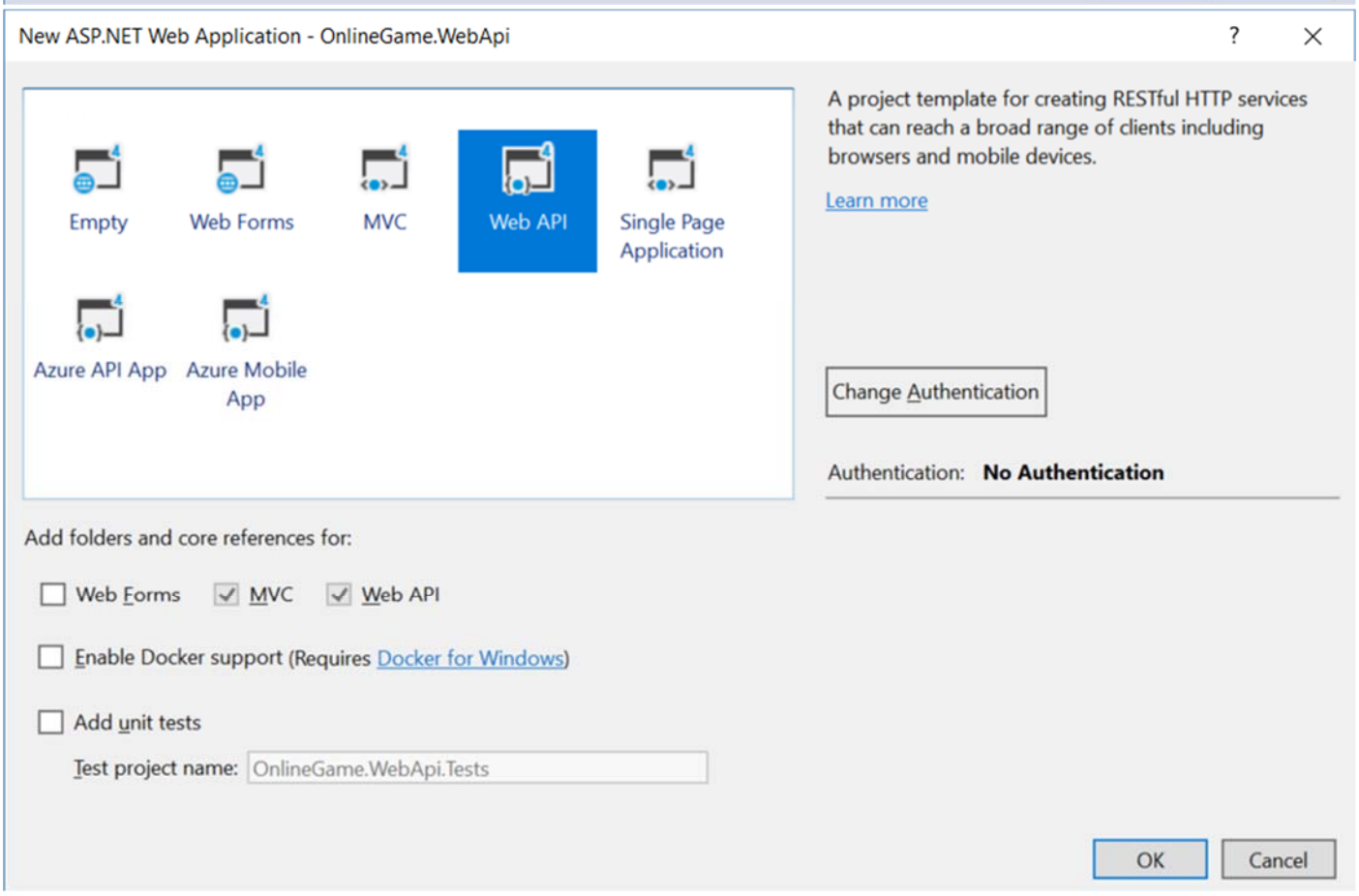
Visual C# --> Web --> ASP.NETWeb Application (.Net Framework)
-->

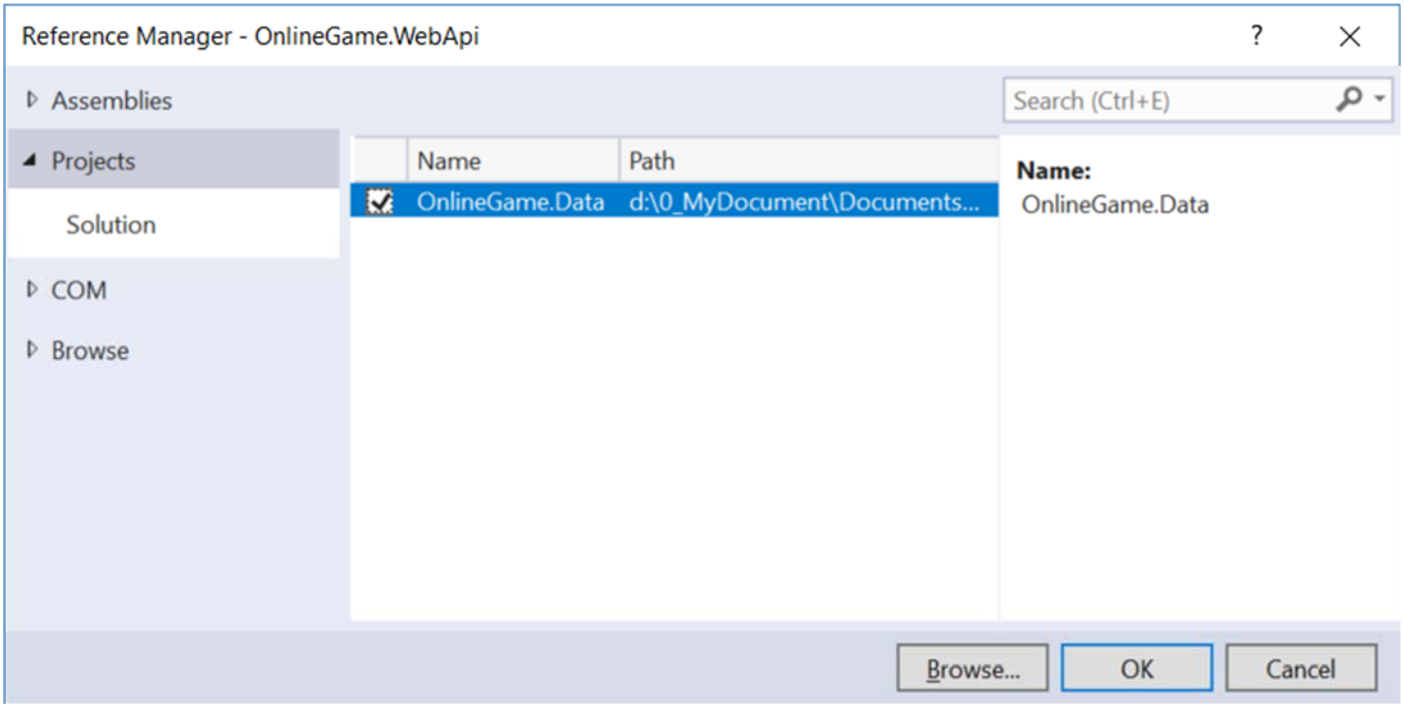
Name: **OnlineGame.WebApi**

--> Select "**Web API**" --> OK

--> Add Reference





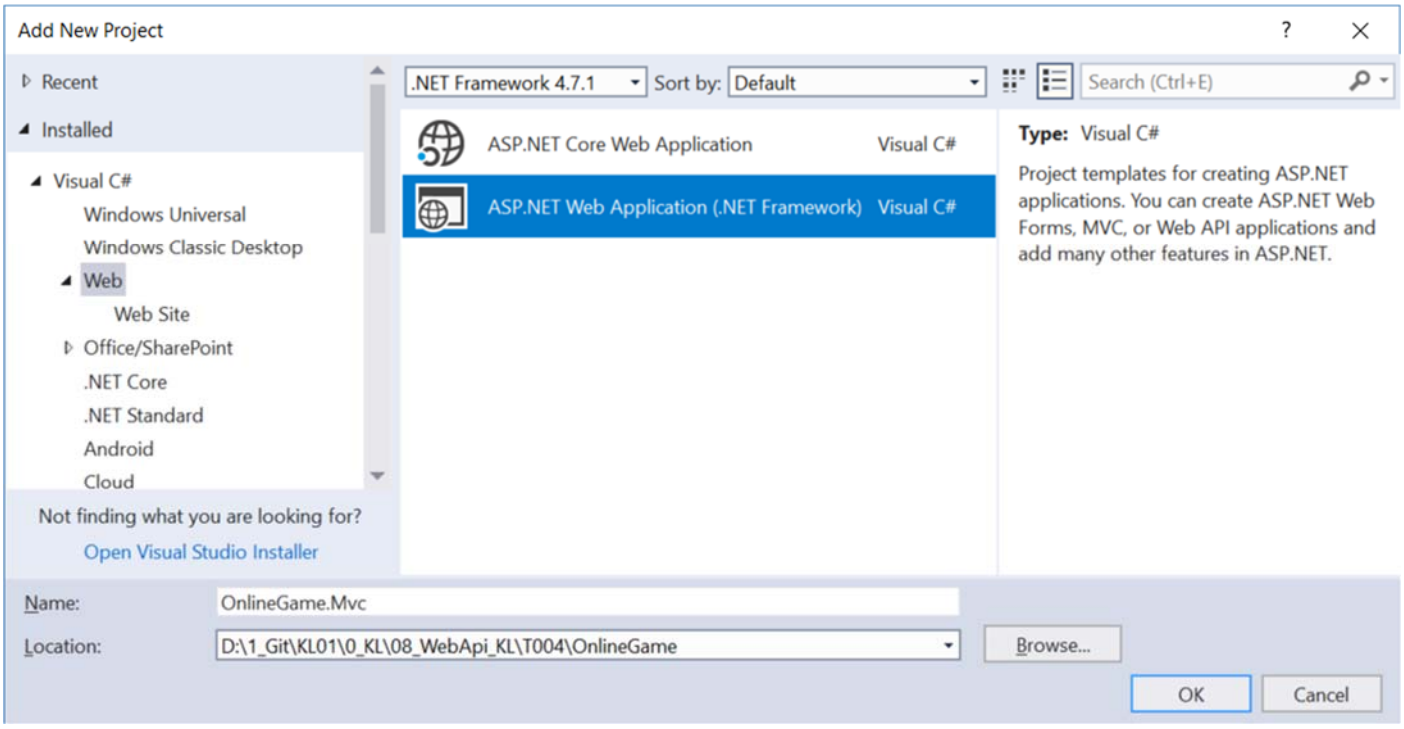


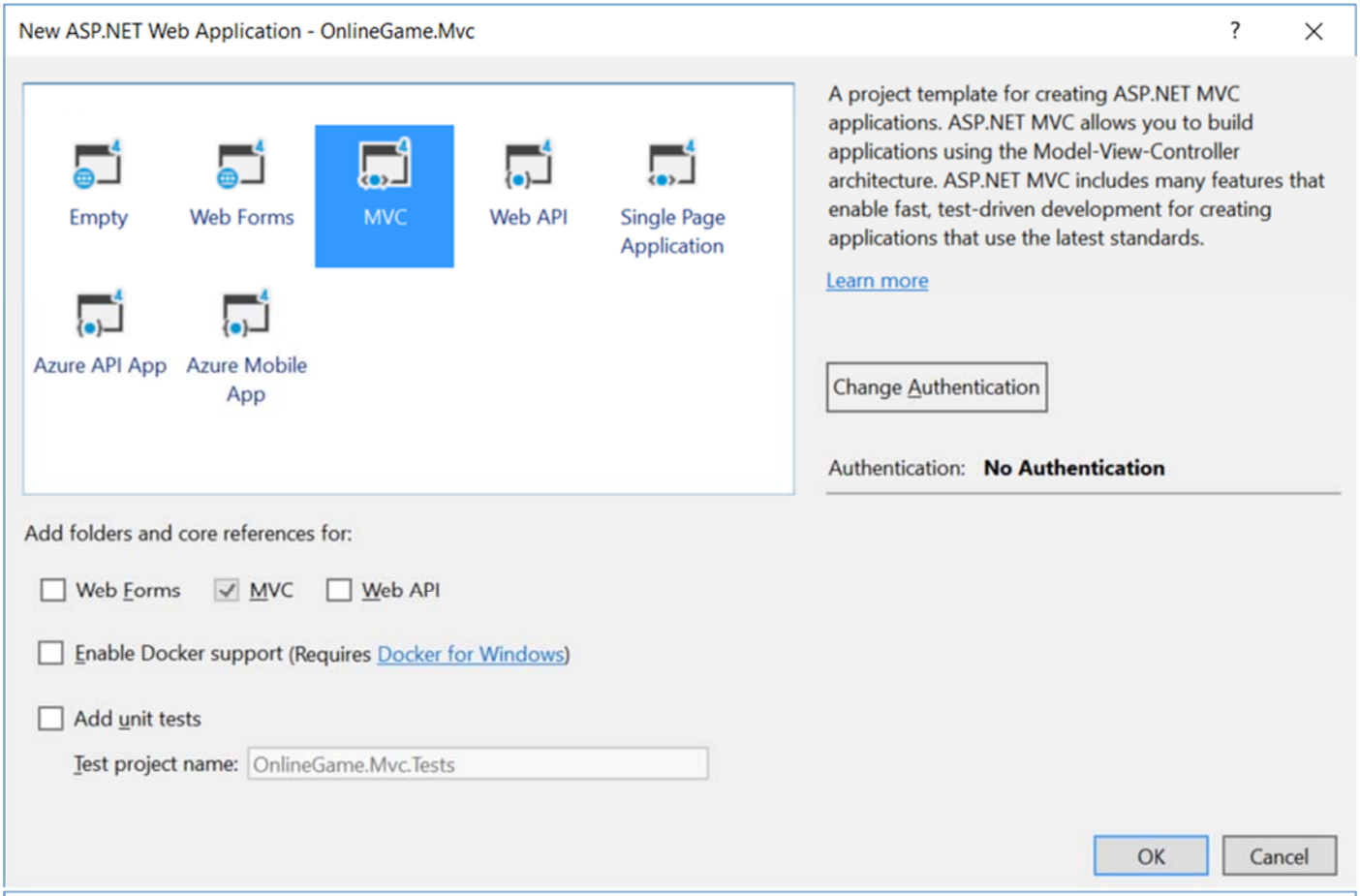
2.4. OnlineGame.Mvc

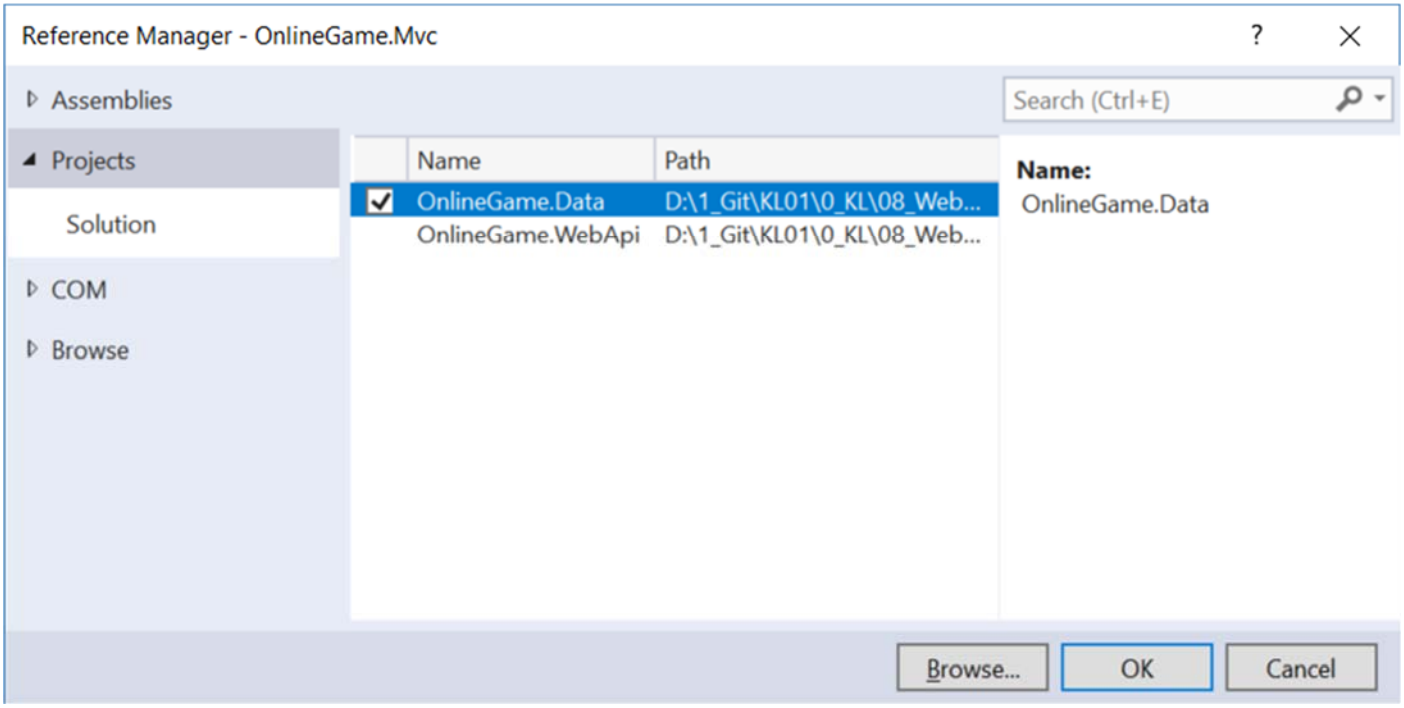
Solutions Name --> Add --> New Project -->

Visual C# --> Web --> ASP.NETWeb Application (.Net Framework)
-->

Name: **OnlineGame.Mvc**
--> Select "**MVC**" --> OK
--> Add Reference



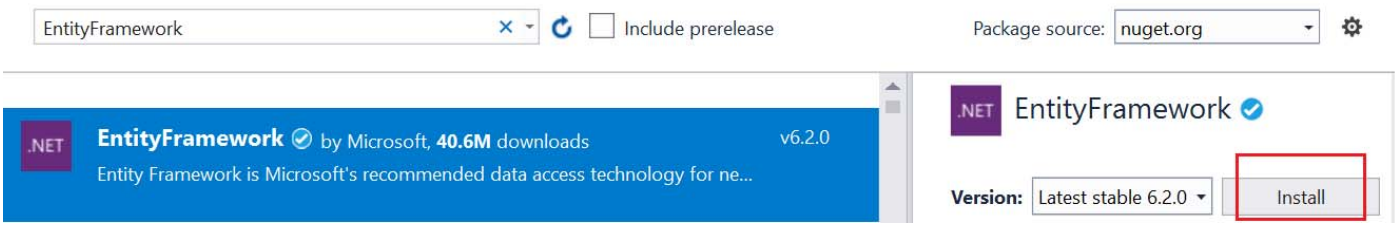




3. OnlineGame.Data

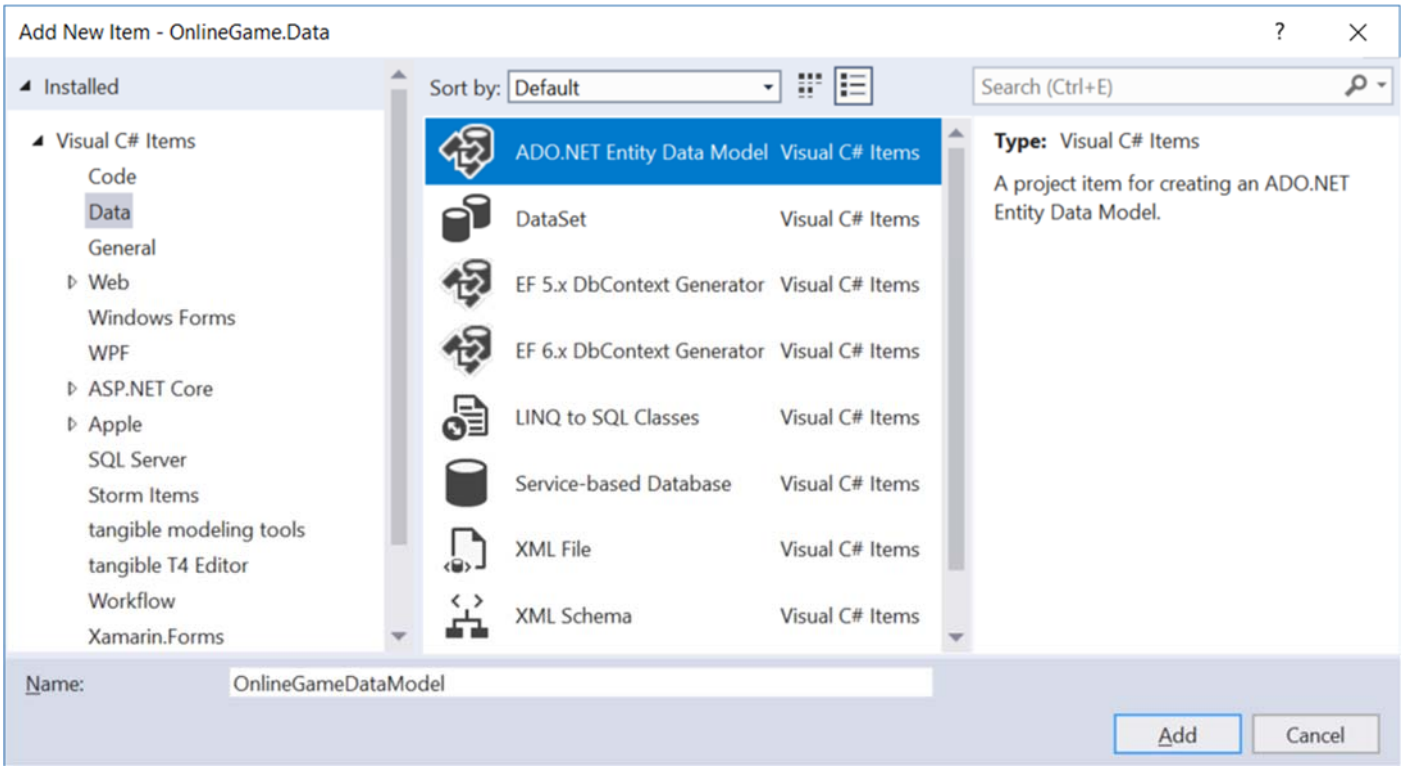
3.1. Install Entity Framework

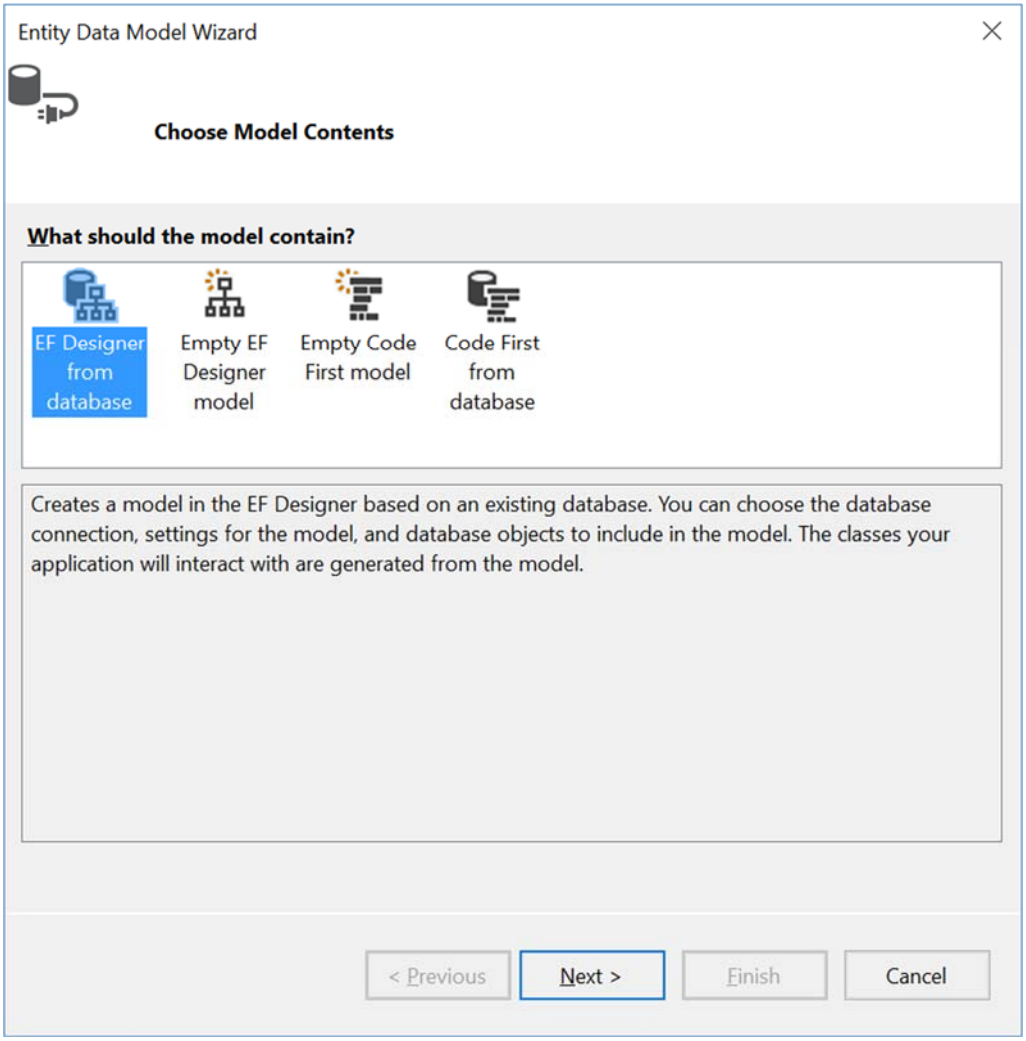
Tools --> NuGet Package Manager --> Manage NuGet Packages for Solutions...
--> Browse tab --> Search : **EntityFramework**
--> Install it

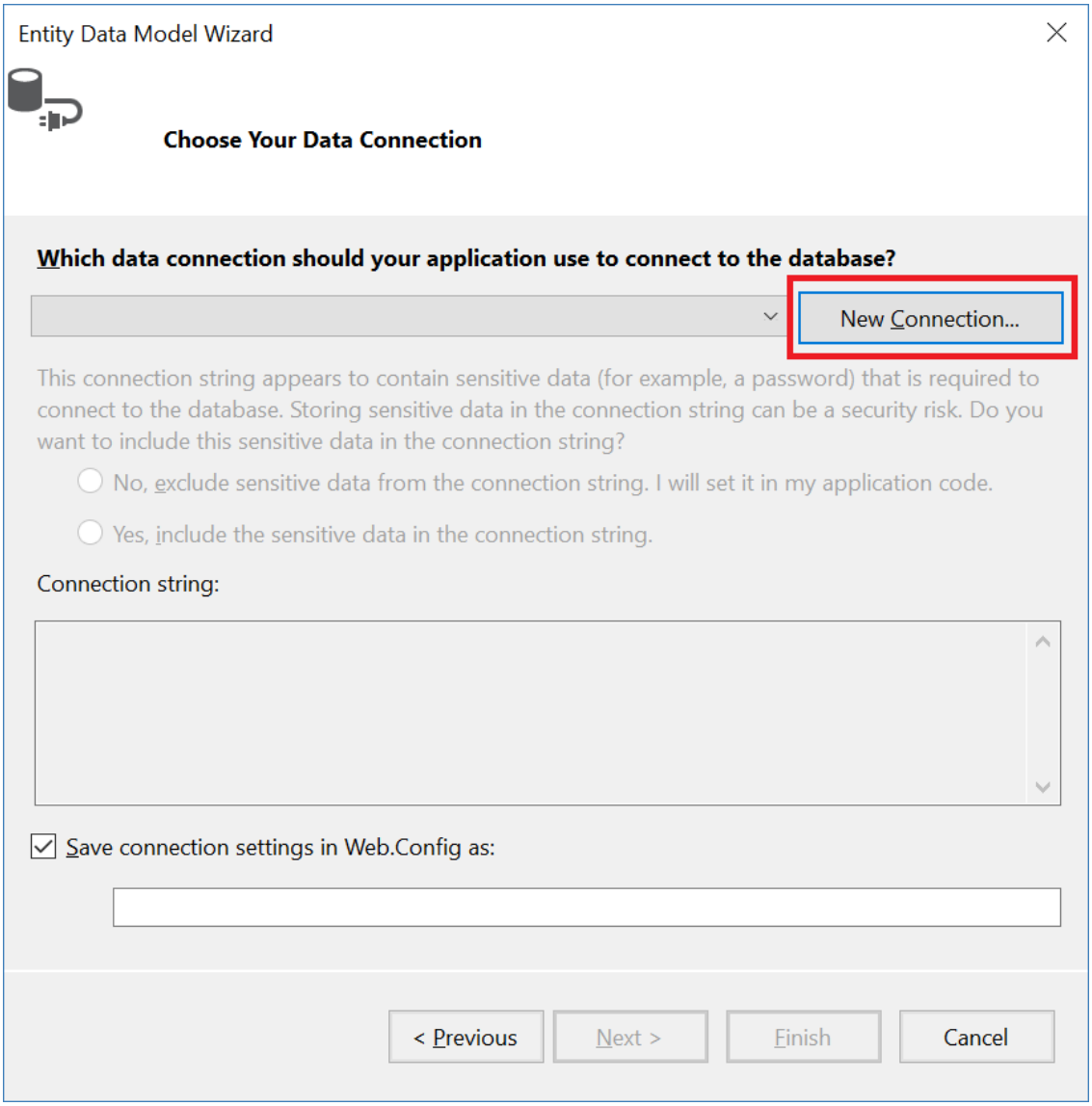


3.2. ADO.Net Entity Data Model - Entity Framework

In Visual Studio 2017
Project Name --> Right Click --> Add --> New Item
--> Visual C# --> Data --> ADO.Net Entity Data Model
Name:
OnlineGameDataModel
-->
EF Designer from database
....
-->
Save Connection settings in Web.Config as:
OnlineGameContext




Entity Data Model Wizard
Choose Model Contents
What should the model contain?
EF Designer from database
Empty EF Designer model
Empty Code First model
Code First from database
Creates a model in the EF Designer based on an existing database. You can choose the database connection, settings for the model, and database objects to include in the model. The classes your application will interact with are generated from the model.
< Previous
Next >
Finish
Cancel


Entity Data Model Wizard
Choose Your Data Connection
Which data connection should your application use to connect to the database?
New Connection...
This connection string appears to contain sensitive data (for example, a password) that is required to connect to the database. Storing sensitive data in the connection string can be a security risk. Do you want to include this sensitive data in the connection string?
No, exclude sensitive data from the connection string. I will set it in my application code.
Yes, include the sensitive data in the connection string.
Connection string:
Save connection settings in Web.Config as:
< Previous
Next >
Finish
Cancel

Connection Properties

Enter information to connect to the selected data source or click "Change" to choose a different data source and/or provider.

Data source:

Microsoft SQL Server (SqlClient) | Change...

Server name:

N550JKL\SQL2016 | Refresh

Log on to the server

Authentication: SQL Server Authentication

User name: Tester2

Password: ••••

☑ Save my password

Microsoft Visual Studio

Test connection succeeded.

OK

Connect to a database

◉ Select or enter a database name:

OnineGame

○ Attach a database file:

Browse...

Advanced...

Test Connection | OK | Cancel

Entity Data Model Wizard

Choose Your Data Connection

Which data connection should your application use to connect to the database?

n550jkl\sql2016.OnlineGame.dbo

New Connection...

This connection string appears to contain sensitive data (for example, a password) that is required to connect to the database. Storing sensitive data in the connection string can be a security risk. Do you want to include this sensitive data in the connection string?

- ○ No, exclude sensitive data from the connection string. I will set it in my application code.
- ◉ Yes, include the sensitive data in the connection string.

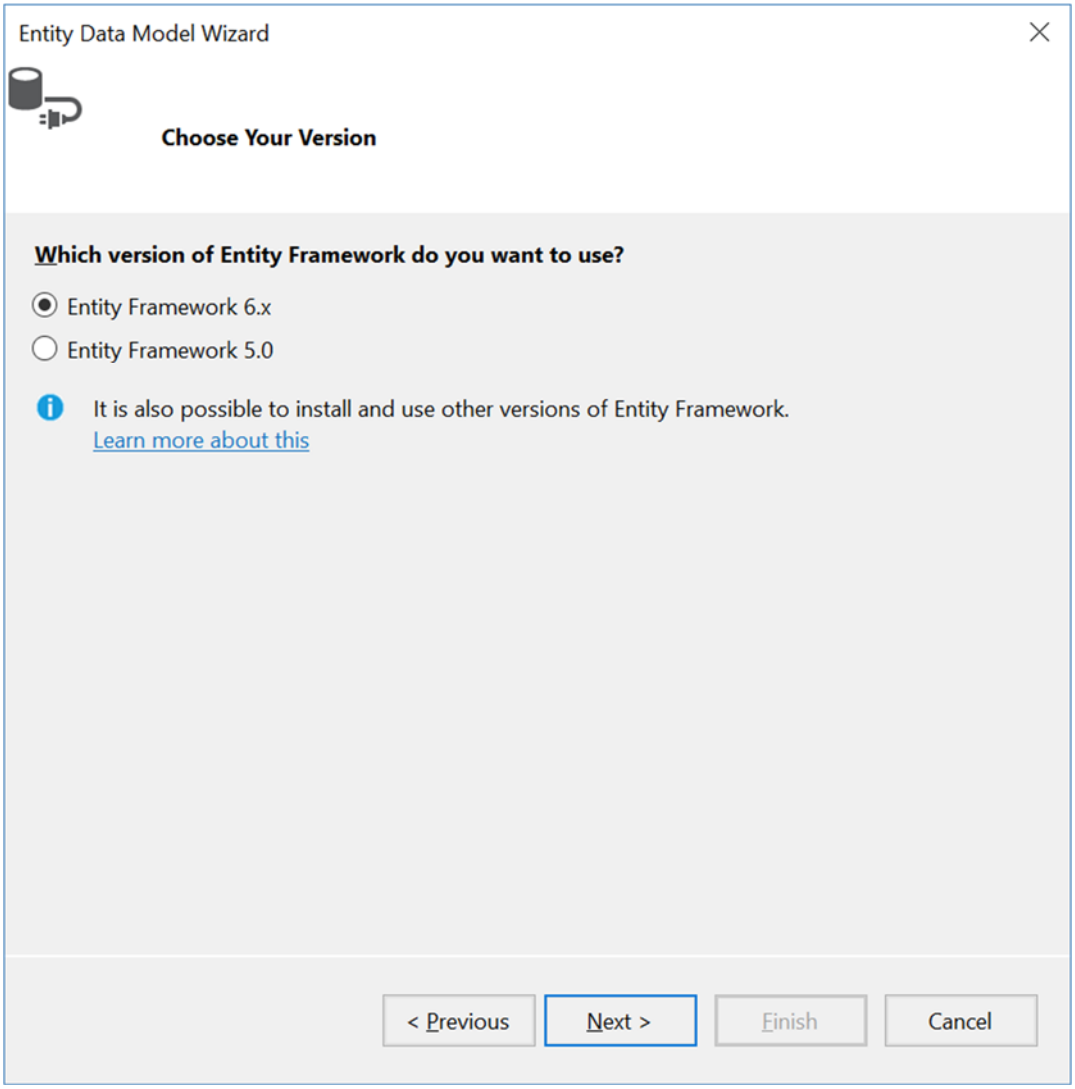
Connection string:

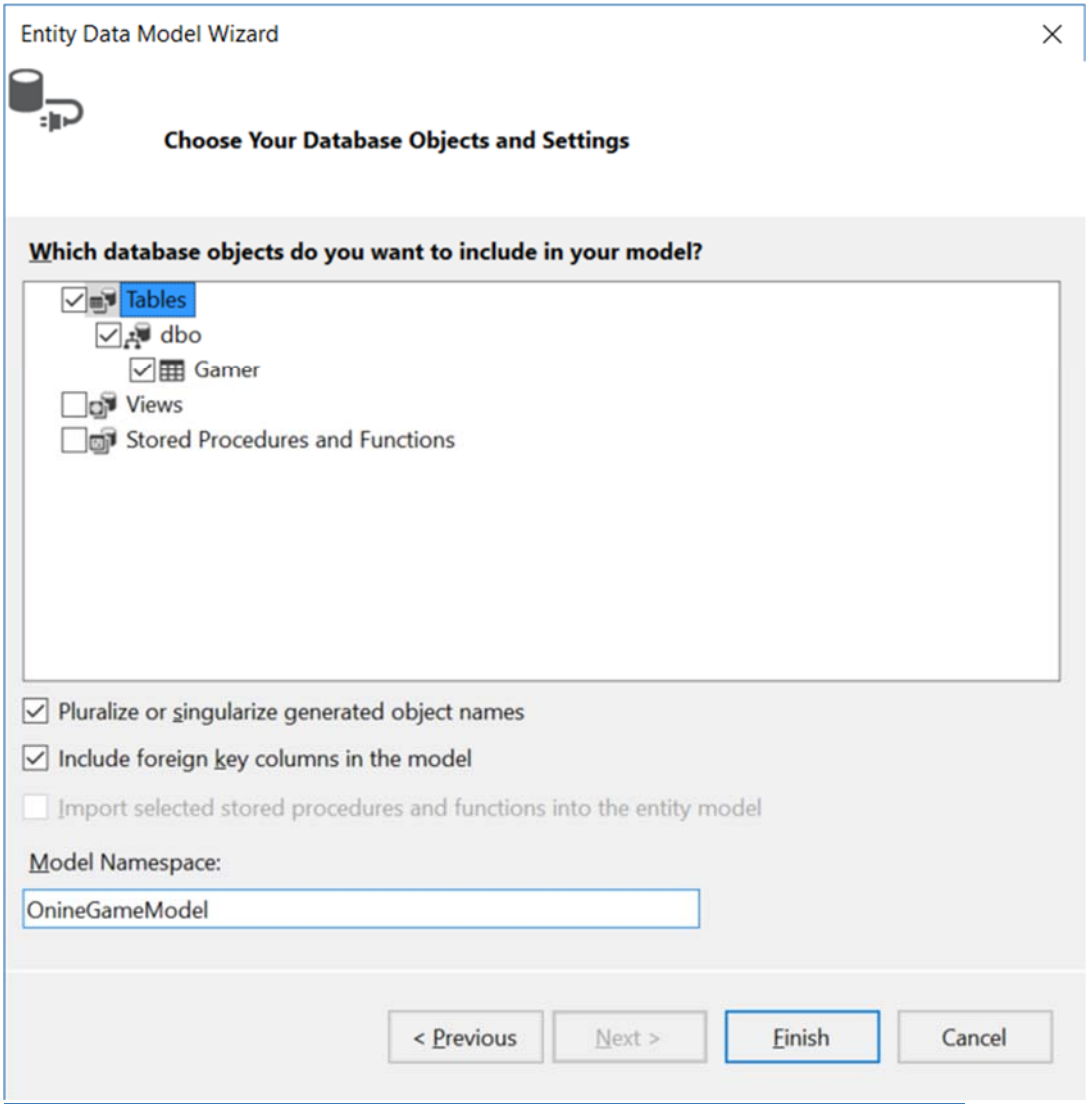
```
metadata=res://*/Models.OnlineGameDataModel.csdl|
res://*/Models.OnlineGameDataModel.ssdl|
res://*/Models.OnlineGameDataModel.msl;provider=System.Data.SqlClient;provider connection
string="data source=N550JKL\SQL2016;initial catalog=OnlineGame;persist security info=True;user
id=Tester;password=***********;MultipleActiveResultSets=True;App=EntityFramework"
```

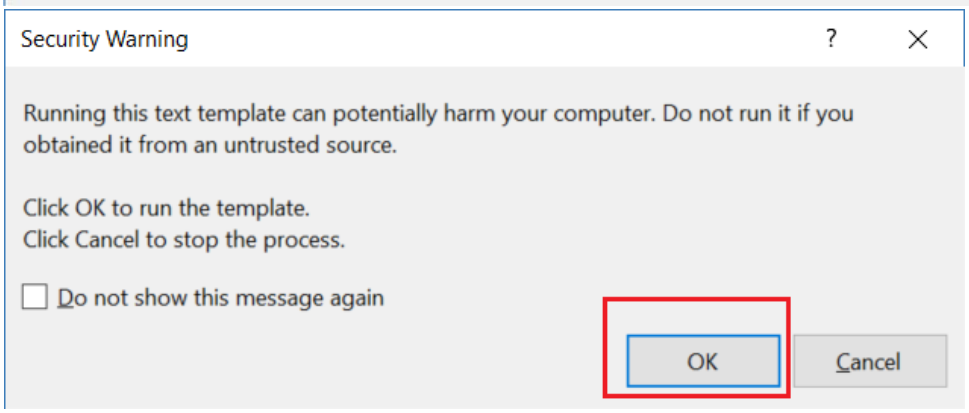
☑ Save connection settings in Web.Config as:

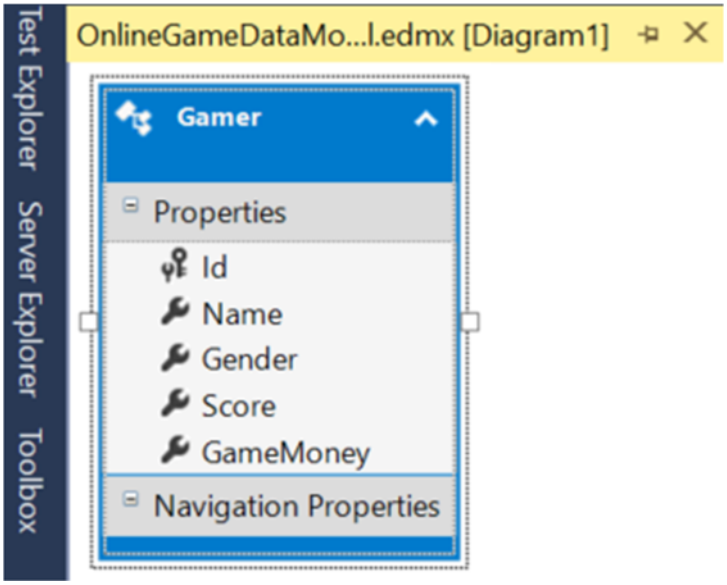
OnlineGameContext

< Previous | Next > | Finish | Cancel


Entity Data Model Wizard
Choose Your Version
Which version of Entity Framework do you want to use?
Entity Framework 6.x
Entity Framework 5.0
It is also possible to install and use other versions of Entity Framework.
Learn more about this
< Previous
Next >
Finish
Cancel


Entity Data Model Wizard
Choose Your Database Objects and Settings
Which database objects do you want to include in your model?
Tables
dbo
Gamer
Views
Stored Procedures and Functions
Pluralize or singularize generated object names
Include foreign key columns in the model
Import selected stored procedures and functions into the entity model
Model Namespace:
OnineGameModel
< Previous
Next >
Finish
Cancel

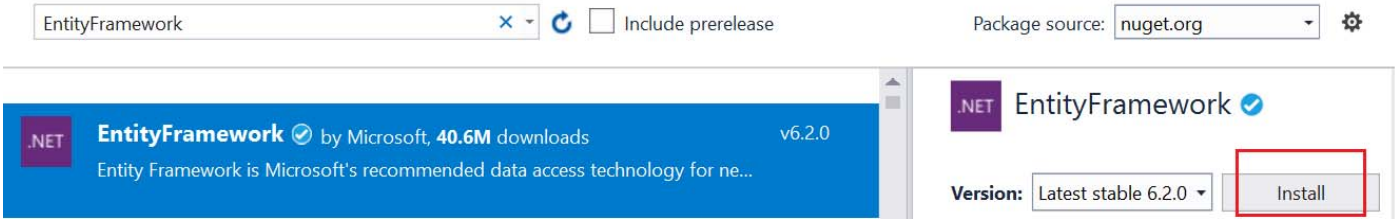

Security Warning
Running this text template can potentially harm your computer. Do not run it if you obtained it from an untrusted source.
Click OK to run the template.
Click Cancel to stop the process.
Do not show this message again
OK
Cancel



4. OnlineGame.WebApi

4.1. Install Entity Framework

Tools --> NuGet Package Manager --> Manage NuGet Packages for Solutions...
--> Browse tab --> Search : **EntityFramework**
--> Install it



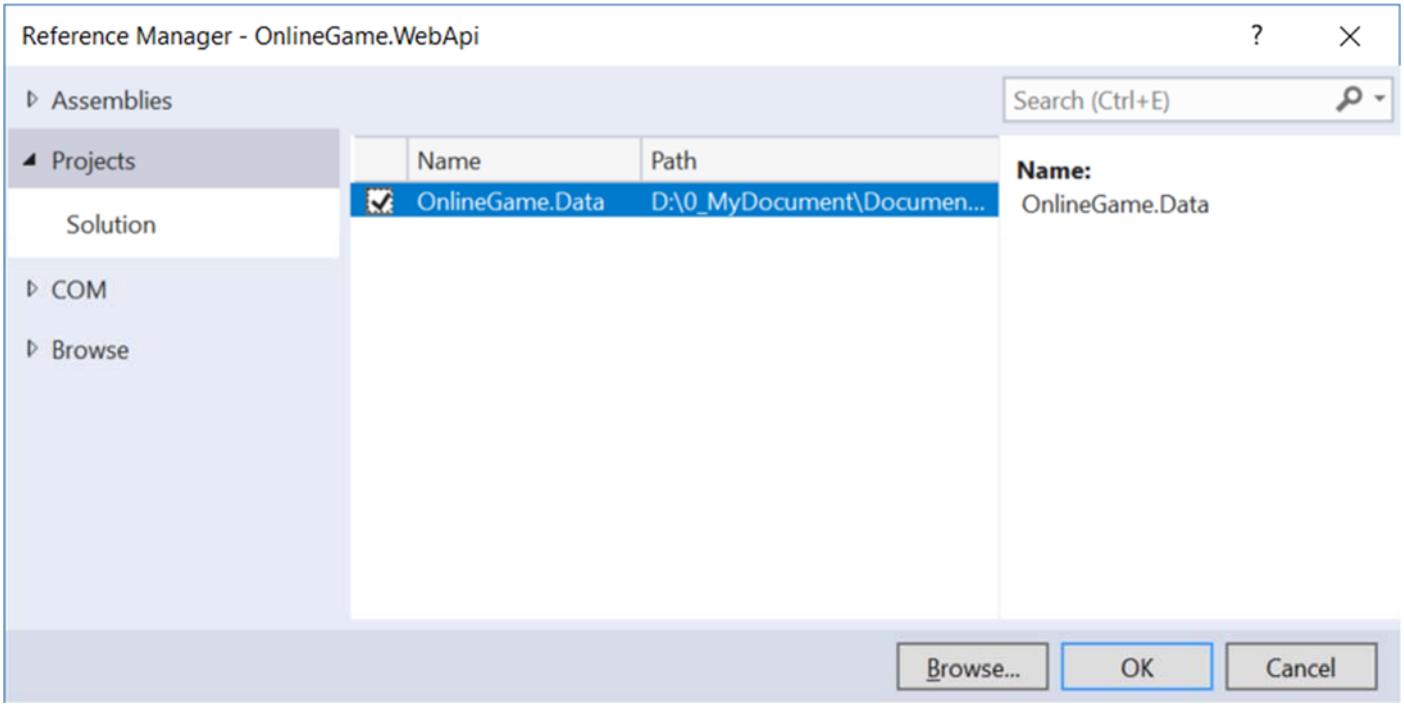
4.2. Web.config : Add Connection String

```
Web.config
    </compilers>
  </system.codedom>
  <entityFramework>
    <defaultConnectionFactory type="System.Data.Entity.Infrastructure.LocalDbConnectionFactory, EntityFramework">
      <parameters>
        <parameter value="mssqllocaldb" />
      </parameters>
    </defaultConnectionFactory>
    <providers>
      <provider invariantName="System.Data.SqlClient" type="System.Data.Entity.SqlServer.SqlProviderServices,
       EntityFramework.SqlServer" />
    </providers>
  </entityFramework>
  <connectionStrings>
    <add name="OnlineGameContext" connectionString="metadata=res://*/OnlineGameDataModel.csdl|res://*/
     OnlineGameDataModel.ssdl|res://*/OnlineGameDataModel.msl;provider=System.Data.SqlClient;provider connection
     string=&quot;data source=N550JKL\SQL2016;initial catalog=OnineGame;persist security info=True;user
     id=Tester2;password=1234;MultipleActiveResultSets=True;App=EntityFramework&quot;"
     providerName="System.Data.EntityClient" />
  </connectionStrings>
</configuration>
```

<connectionStrings>

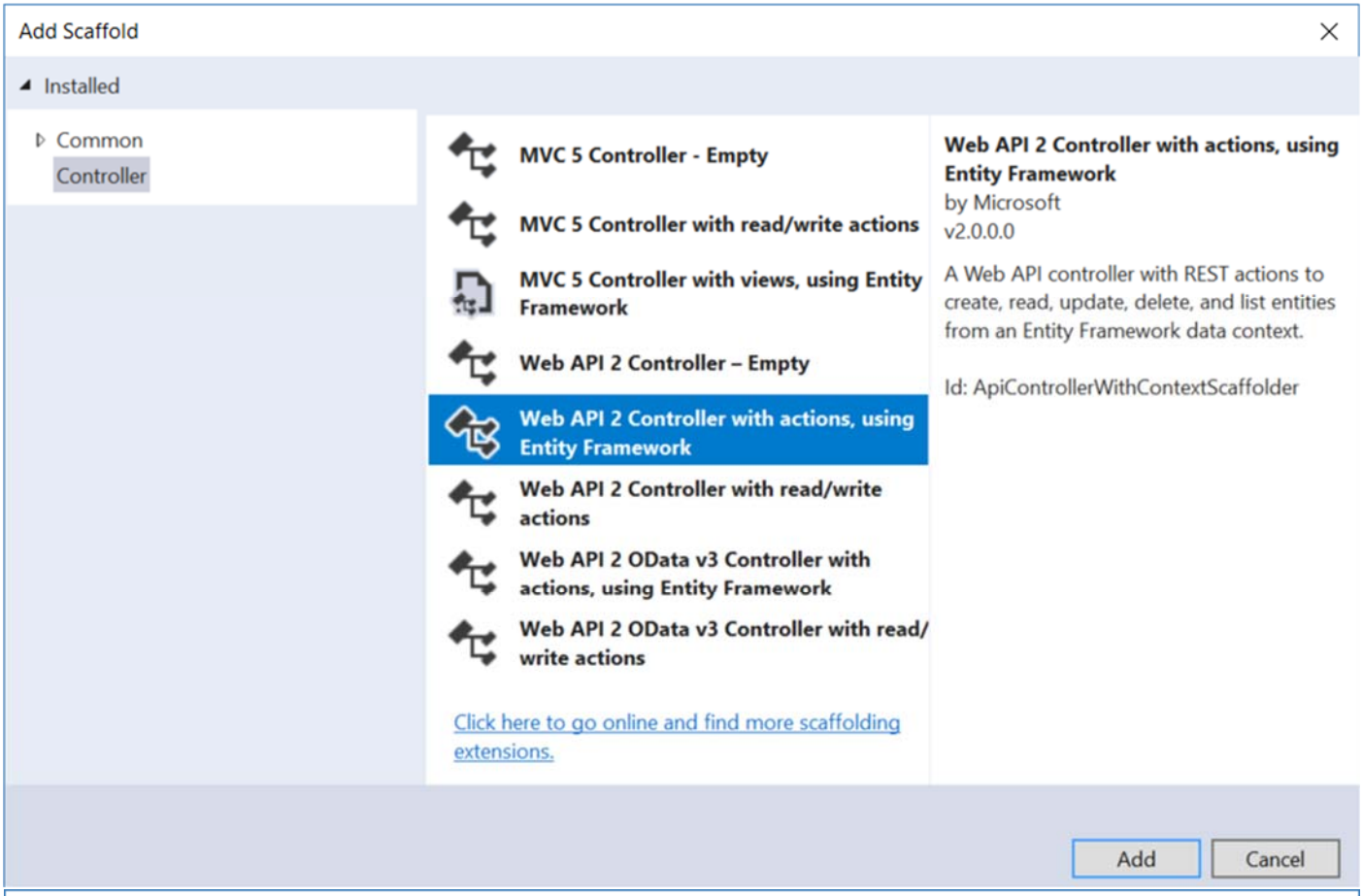
```
    <add name="OnlineGameContext" connectionString="metadata=res://*/OnlineGameDataModel.csdl|res://*/OnlineGameDataModel.ssdl|res://*/OnlineGameDataModel.msl;provider=System.Data.SqlClient;provider connection string=&quot;data source=N550JKL\SQL2016;initial catalog=OnineGame;persist security info=True;user id=Tester2;password=1234;MultipleActiveResultSets=True;App=EntityFramework&quot;" providerName="System.Data.EntityClient" />
  </connectionStrings>
```

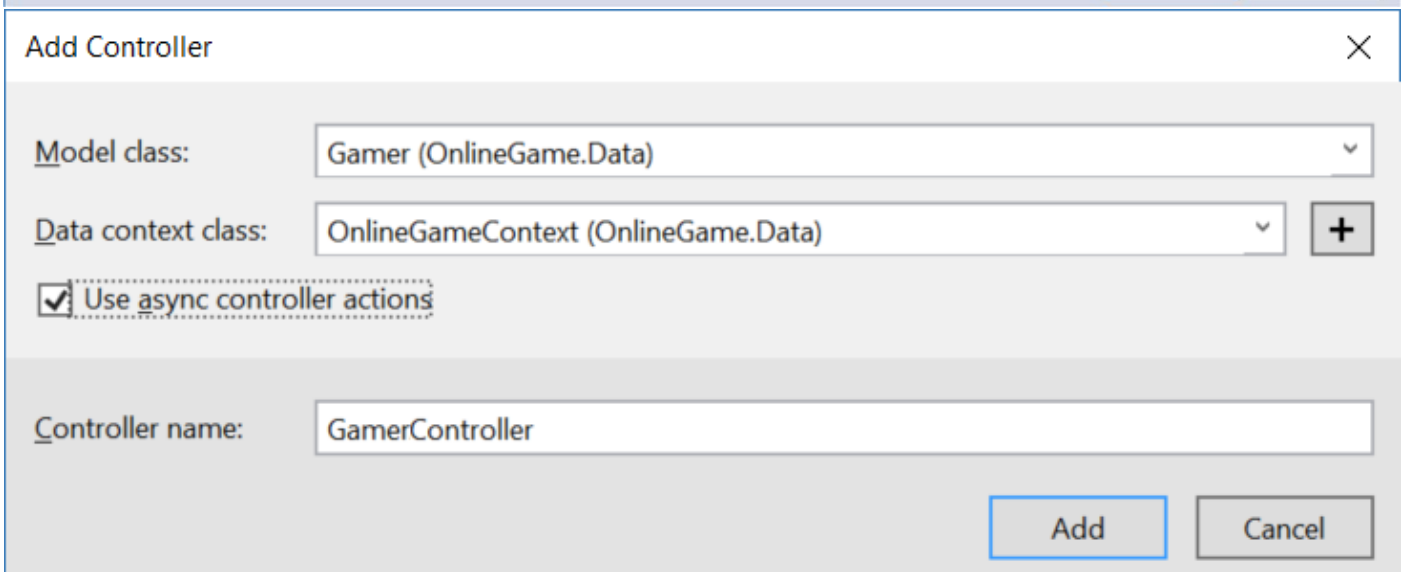
4.3. Add Reference



4.4. Controllers/Api/GamerController.cs

Controllers/Api folder --> Right Click --> Add --> Controller
--> **Web API 2 Controller with actions, using Entity Framework**
--> **GamerController**
if you have any error message, please ensure re-build whole solutions.






```
using System.Collections.Generic;
using System.Data.Entity;
using System.Data.Entity.Infrastructure;
using System.Linq;
using System.Threading.Tasks;
using System.Web.Http;
using System.Web.Http.Description;
using OnlineGame.Data;
namespace OnlineGame.WebApi.Controllers.Api
{
    public class GamerController : ApiController
    {
        private OnlineGameContext _db = new OnlineGameContext();
        ////GET: api/Gamer
        //[HttpGet]
```

```
        //public IQueryable<Gamer> LoadGamers()
        ////public IQueryable<Gamer> GetGamers()
        //{
        //    return _db.Gamers;
        //}
        //GET: api/gamer?gender=female  --> Only Female Gamer
        //GET: api/gamer? gender = male-- > Only Male Gamer
        //GET: api/gamer --> All Gamers
        [HttpGet]
        public async Task<IHttpActionResult> LoadGamers(string gender = "")
        //public IQueryable<Gamer> GetGamers()
        {
            List<Gamer> gamers;
            switch (gender.ToLower())
            {
                case "male":
                    gamers = await _db.Gamers.Where(g => g.Gender.ToLower() == "male").ToListAsync();
                    break;
                case "female":
                    gamers = await _db.Gamers.Where(g => g.Gender.ToLower() == "female").ToListAsync();
                    break;
                default:
                    gamers = await _db.Gamers.ToListAsync();
                    break;
            }
            return Ok(gamers);   //200
        }
        // GET: api/Gamer/5
        [ResponseType(typeof(Gamer))]
        [HttpGet]
        public async Task<IHttpActionResult> LoadGamer(int id)
        //public async Task<IHttpActionResult> GetGamer(int id)
        {
            Gamer gamer = await _db.Gamers.FindAsync(id);
            if (gamer == null) return NotFound();  //404
            return Ok(gamer);   //200
        }
        // PUT: api/Gamer/5
        [ResponseType(typeof(void))]
        //public async Task<IHttpActionResult> PutGamer(int id, Gamer gamer)
        [HttpPut]
        //public async Task<IHttpActionResult> UpdateGamer(int id, Gamer gamer)
        public async Task<IHttpActionResult> UpdateGamer([FromUri]int id, [FromBody]Gamer gamer)    //By
Default
        //public async Task<IHttpActionResult> UpdateGamer([FromBody]int id, [FromUri]Gamer gamer)
        {
            if (!ModelState.IsValid) return BadRequest(ModelState);  //400
            //if (id != gamer.Id)   return BadRequest();
            //1.
            gamer.Id = id;
            _db.Entry(gamer).State = EntityState.Modified;  //update the gamer
            //2.
            //Gamer currentGamer = await _db.Gamers.FirstOrDefaultAsync(g => g.Id == id);
            //if (currentGamer == null) return NotFound();  //404
            //currentGamer.Name = gamer.Name;
            //currentGamer.Gender = gamer.Gender;
```

```
        //currentGamer.Score = gamer.Score;
        //currentGamer.GameMoney = gamer.GameMoney;
        try
        {
            await _db.SaveChangesAsync();
            return Ok();    //200
        }
        catch (DbUpdateConcurrencyException)
        {
            if (!GamerExists(id)) return NotFound();  //404
            throw;
        }
    }
    // POST: api/Gamer
    [ResponseType(typeof(Gamer))]
    [HttpPost]
    public async Task<IHttpActionResult> InsertGamer([FromBody]Gamer gamer)
    //public async Task<IHttpActionResult> PostGamer([FromBody]Gamer gamer)
    {
        if (!ModelState.IsValid) return BadRequest(ModelState); //400
        _db.Gamers.Add(gamer);
        await _db.SaveChangesAsync();
        //Return Created/201.
        //1.
        return CreatedAtRoute("DefaultApi", new { id = gamer.Id }, gamer);    //Created/201
        ////Return Created/201.
        ////2.
        ////If you want to return HttpResponseMessage()
        ////2.
        ////Create a HttpResponseMessage with status code 201 Item Created.
        ////Pass the gamer into 2nd parameter as the created value.
        //HttpResponseMessage message =
        //    Request.CreateResponse(HttpStatusCode.Created, gamer);
        ////The Headers.Location should know the URI of the created item.
        //message.Headers.Location = new Uri(Request.RequestUri +
        //    gamer.Id.ToString());
        //return message;   //Created/201
        ////Return OK/200.
        ////3.
        ////if you want to return OK/200 when item created.
        //return Created(new Uri(Request.RequestUri + gamer.Id.ToString()), gamer);    //OK/200
    }
    // DELETE: api/Gamer/5
    [ResponseType(typeof(Gamer))]
    //[HttpDelete]
    //public async Task<IHttpActionResult> RemoveGamer(Gamer gamer)
    public async Task<IHttpActionResult> DeleteGamer(int id)
    {
        Gamer gamer = await _db.Gamers.FindAsync(id);
        if (gamer == null) return NotFound();   //404
        _db.Gamers.Remove(gamer);
        await _db.SaveChangesAsync();
        return Ok(gamer);   //200
    }
    protected override void Dispose(bool disposing)
    {
```

```
            if (disposing) _db.Dispose();   //Dispose DBContext
            base.Dispose(disposing);
        }
        private bool GamerExists(int id)
        {
            return _db.Gamers.Count(e => e.Id == id) > 0;
        }
    }
}
/*
1.
1.1.
By default, the HTTP verb GET maps to a method that has the name Get() or "Get" prefix.
E.g. Get(), GetGamers, GetXXX()
If you want the HTTP verb GET maps to the method name without "Get" prefix.
You can use [HttpGet] attribute.
1.2.
[HttpGet] attribute maps HTTP verb GET.
[HttpPost] attribute maps HTTP verb POST.
[HttpPut] attribute maps HTTP verb PUT.
[HttpDelete] attribute maps HTTP verb DELETE.
----------------------------
2.
[FromUri] V.S. [FromBody]
Web Api default binding parameter convention
2.1.
By default, if the parameter is a simple type,
Web Api will try to get value from uri.
E.g. int, double, bool, ...etc.
2.2.
By default, if the parameter is a complex type,
Web Api will try to get value from the request body.
E.g. Gamer
-----------------
2.3.
//[HttpPut]
//public async Task<IHttpActionResult> UpdateGamer(int id, Gamer gamer)
By Default, the Web Api will try to get id from uri, and gamer from request body as below code.
//[HttpPut]
//public async Task<IHttpActionResult> UpdateGamer([FromUri]int id, [FromBody]Gamer gamer)
E.g.
A.
PUT
http://localhost:58302/api/Gamer/8
B.
Request Header
Host: localhost:58302
Content-Type: application/json
B.1.
Accept: application/json
means we request JSON format response.
B.2.
Content-Type: application/json
The client will post a data to the server, the data format is JSON
C.
Request Body
{
"Name":"NameEight XYZ222",
"Gender":"Male",
"Score":450,
"GameMoney":1500
}
-----------------
2.4.
//[HttpPut]
//public async Task<IHttpActionResult> UpdateGamer([FromBody]int id, [FromUri]Gamer gamer)
```

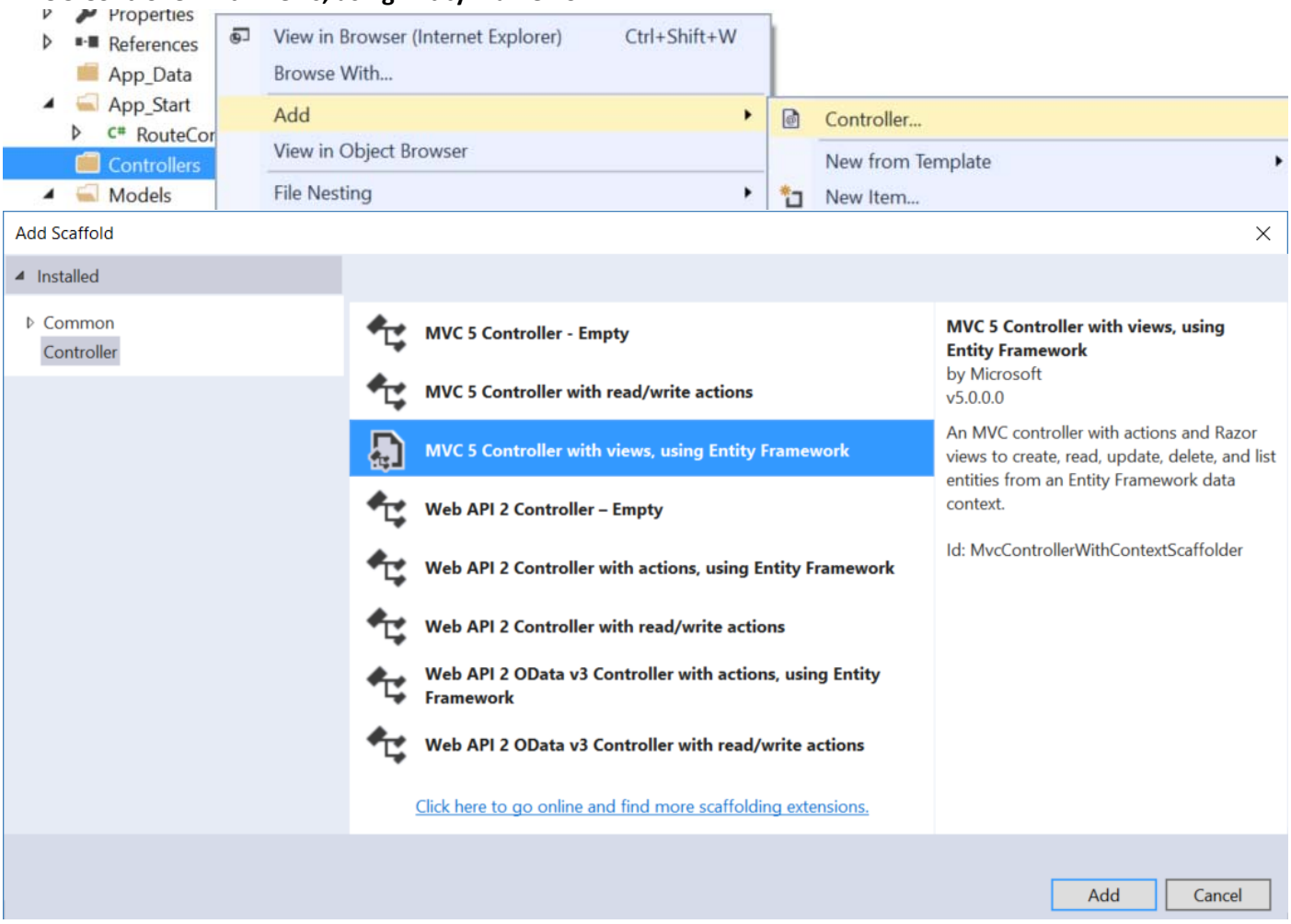
```
[FromBody] will enfroce to get id from request body
[FromUri] will enforce to get gamer from uri
E.g.
A.
PUT
http://localhost:58302/api/Gamer?Name=NameEight%20XYZ333&Gender=Male&Score=450&GameMoney=1500
B.
Request Header
Host: localhost:58302
Content-Type: application/json
B.1.
Accept: application/json
means we request JSON format response.
B.2.
Content-Type: application/json
The client will post a data to the server, the data format is JSON
C.
Request Body
8
*/
```

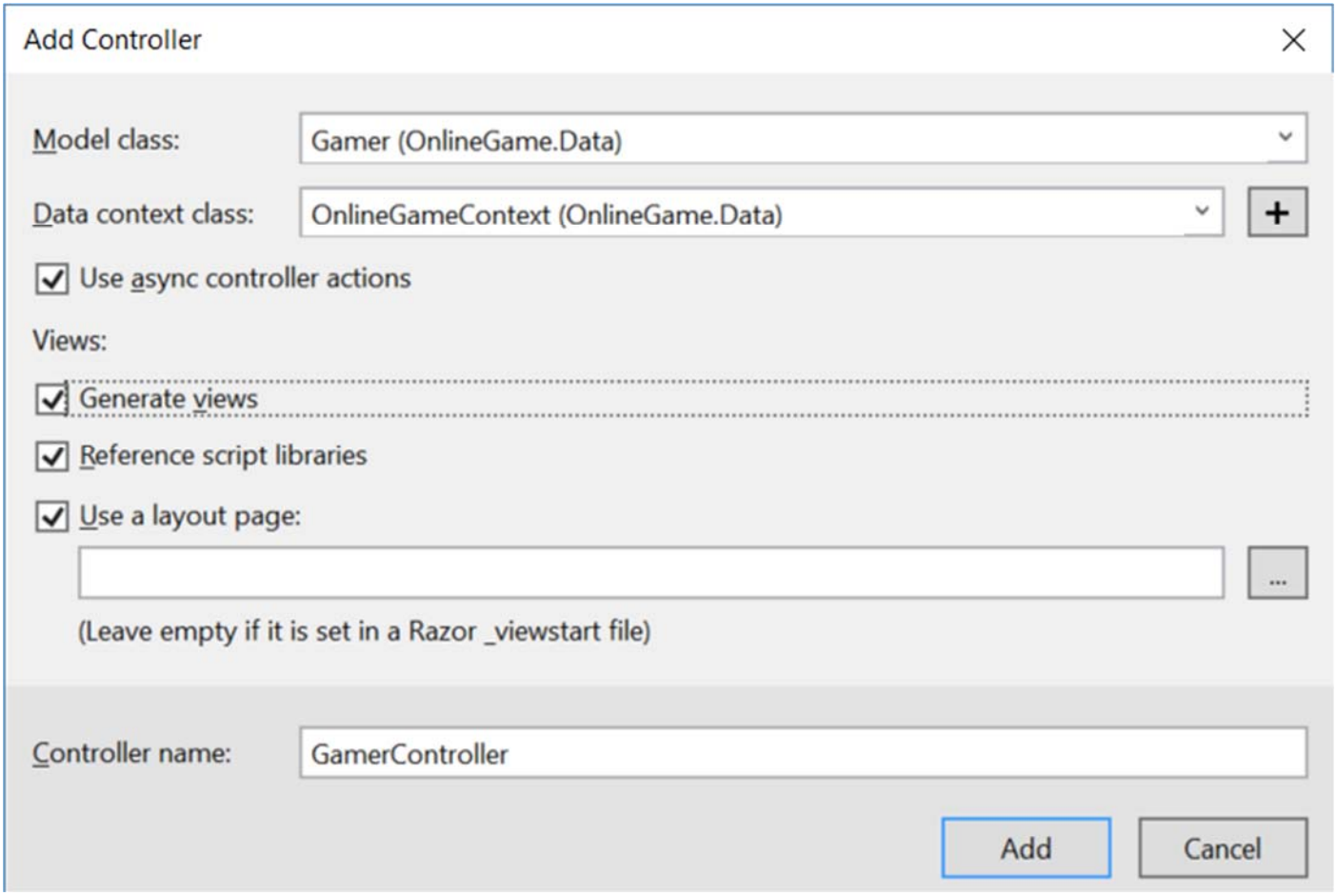
4.5. Controllers/GamerController.cs

Controllers --> Right click --> Add --> Controller

-->

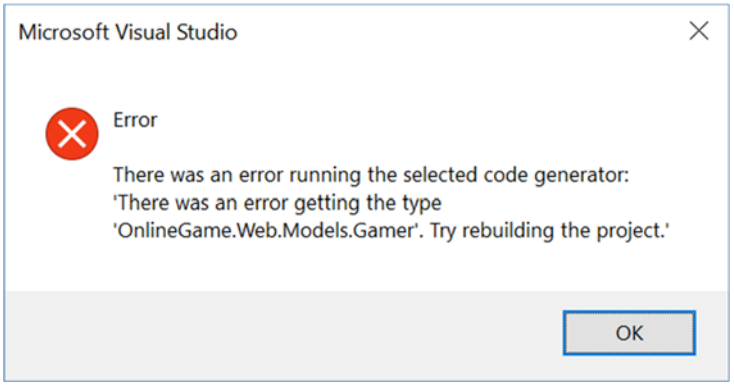
MVC 5 Controller with views, using Entity Framework





It will automatically generate the controller, views, and several javascript and css files.

If you see the following error message, then you have to re-build solution before you create the controller.




```
using System.Data.Entity;
using System.Threading.Tasks;
usingSystem.Net;
using System.Web.Mvc;
using OnlineGame.Data;
namespace OnlineGame.WebApi.Controllers
{
    public class GamerController : Controller
    {
        private OnlineGameContext _db = new OnlineGameContext();
        // GET: Gamer
        [HttpGet]
        public async Task<ActionResult> Index()
        {
            return View(await _db.Gamers.ToListAsync());
        }
        // GET: Gamer
        [HttpGet]
```

```
        public ActionResult Index2()
        {
            return View();
        }
        // GET: Gamer/Details/5
        [HttpGet]
        public async Task<ActionResult> Details(int? id)
        {
            if (id == null) return new HttpStatusCodeResult(HttpStatusCode.BadRequest);
            Gamer gamer = await _db.Gamers.FindAsync(id);
            if (gamer == null) return HttpNotFound();
            return View(gamer);
        }
        // GET: Gamer/Create
        [HttpGet]
        public ActionResult Create()
        {
            return View();
        }
        // POST: Gamer/Create
        // To protect from overposting attacks, please enable the specific properties you want to bind to,
for
        // more details see https://go.microsoft.com/fwlink/?LinkId=317598.
        [HttpPost]
        [ValidateAntiForgeryToken]
        public async Task<ActionResult> Create([Bind(Include = "Id,Name,Gender,Score,GameMoney")] Gamer
gamer)
        {
            if (!ModelState.IsValid) return View(gamer);
            _db.Gamers.Add(gamer);
            await _db.SaveChangesAsync();
            return RedirectToAction("Index");
        }
        // GET: Gamer/Edit/5
        [HttpGet]
        public async Task<ActionResult> Edit(int? id)
        {
            if (id == null) return new HttpStatusCodeResult(HttpStatusCode.BadRequest);
            Gamer gamer = await _db.Gamers.FindAsync(id);
            if (gamer == null) return HttpNotFound();
            return View(gamer);
        }
        // POST: Gamer/Edit/5
        // To protect from overposting attacks, please enable the specific properties you want to bind to,
for
        // more details see https://go.microsoft.com/fwlink/?LinkId=317598.
        [HttpPost]
        [ValidateAntiForgeryToken]
        public async Task<ActionResult> Edit([Bind(Include = "Id,Name,Gender,Score,GameMoney")] Gamer
gamer)
        {
            if (!ModelState.IsValid) return View(gamer);
            _db.Entry(gamer).State = EntityState.Modified;
            await _db.SaveChangesAsync();
            return RedirectToAction("Index");
        }
        // GET: Gamer/Delete/5
        [HttpGet]
```

```
        public async Task<ActionResult> Delete(int? id)
        {
            if (id == null) return new HttpStatusCodeResult(HttpStatusCode.BadRequest);
            Gamer gamer = await _db.Gamers.FindAsync(id);
            if (gamer == null) return HttpNotFound();
            return View(gamer);
        }
        // POST: Gamer/Delete/5
        [HttpPost, ActionName("Delete")]
        [ValidateAntiForgeryToken]
        public async Task<ActionResult> DeleteConfirmed(int id)
        {
            Gamer gamer = await _db.Gamers.FindAsync(id);
            if (gamer != null) _db.Gamers.Remove(gamer);
            await _db.SaveChangesAsync();
            return RedirectToAction("Index");
        }
        protected override void Dispose(bool disposing)
        {
            if (disposing) _db.Dispose();
            base.Dispose(disposing);
        }
    }
}
```

4.6. Views/Gamer/Index2.cshtml - Jquery AJAX call Web API

```
@{
    ViewBag.Title = "Index2";
}
<h2>Index2</h2>
<div>
    <input id="btnGamerList" type="button" value="Gamer List" />
    <input id="btnGamerTable" type="button" value="Gamer Table" />
    <input id="btnClear" type="button" value="Clear" />
    <ul id="ulGamers"></ul>
    <table id="tblGamers"></table>
</div>
<script src="~/Scripts/jquery-1.10.2.min.js"></script>
<script type="text/javascript">
    $(document).ready(function () {
        var ulGamers = $('#ulGamers');
        var tblGamers = $('#tblGamers');
        var gamerApiUrl = '/api/gamer/';
        $('#btnGamerList').click(function () {
            $.ajax({
                type: 'GET',
                url: gamerApiUrl,
                dataType: 'json',
                success: function (data) {
                    ulGamers.empty();
                    $.each(data, function (index, val) {
                        var name = val.Name;
                        ulGamers.append('<li>' + name + '</li>');
                    });
                }
            });
```

```
        });
        $('#btnGamerTable').click(function () {
            $.ajax({
                type: 'GET',
                url: gamerApiUrl,
                dataType: 'json',
                success: function (data) {
                    tblGamers.empty();
                    tblGamers.append('<tr><th>Id</th><th>Name</th><th>Gender</th><th>Score</th><th>GameMo
ney</th></tr>');
                    $.each(data, function (index, val) {
                        tblGamers.append('<tr>' +
                            '<td>' + val.Id + '</td>' +
                            '<td>' + val.Name + '</td>' +
                            '<td>' + val.Gender + '</td>' +
                            '<td>' + val.Score + '</td>' +
                            '<td>' + val.GameMoney + '</td>' +
                            '</tr>');
                    });
                }
            });
        });
        $('#btnClear').click(function () {
            ulGamers.empty();
            tblGamers.empty();
        });
    });
</script>
```

Index2

Gamer List | Gamer Table | Clear

- NameOne ABC
- NameTwo ABCDE
- NameThree EFGH
- NameFour HIJKLMN
- NameFive NOP
- NameSix PQRSTUVW
- NameSeven XYZ

Id	Name	Gender	Score	GameMoney
1	NameOne ABC	Male	5000	550
2	NameTwo ABCDE	Female	4500	1200
3	NameThree EFGH	Male	6500	3050
4	NameFour HIJKLMN	Female	45000	450
5	NameFive NOP	Male	3000	200
6	NameSix PQRSTUVW	Male	4000	700
7	NameSeven XYZ	Male	450	1500

5. OnlineGame.Mvc

5.1. Jquery AJAX may call Web API in the same origin

For security reason, web browsers do not allow Jquery AJAX call Web API in the different origin.
There are 2 popular ways to fix it.
1.
JSONP (JSON with Padding) will wrap the JSON data in a function
Install-Package **WebApiContrib.Formatting.Jsonp**
E.g.1.1. JSON

```
{
   "Name":"KL",
    "Gender":"Male"
}
```

E.g.1.2. JSONP

```
CallbackFunction({
   "Name":"KL",
    "Gender":"Male"
```

})

2.
Enable CORS (Cross Origin Resource Sharing)
Install-Package **Microsoft.AspNet.WebApi.Cors**

The following examples have the **same origin**.
http://localhost:1234/api/gamer
http://localhost:1234/gamer/Index2

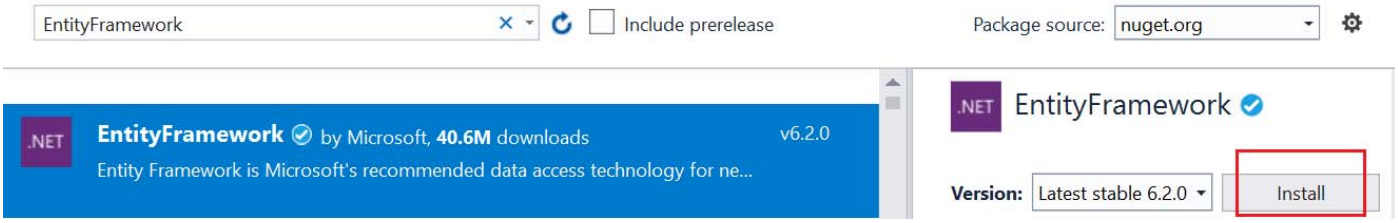
The following examples have **different port** numbers, so they are **different origins**.
http://localhost:**1234**/api/gamer
http://localhost:**4321**/gamer/Index2

The following examples have **different domains**, so they are **different origins**.
http://AAAA.**com**/api/gamer
http://AAAA.**net**/gamer/Index2

The following examples have **different schemes**, so they are **different origins**.
https://AAAA.com/api/gamer
http://AAAA.com/gamer/Index2

5.2. Install Entity Framework

Tools --> NuGet Package Manager --> Manage NuGet Packages for Solutions...
--> Browse tab --> Search : **EntityFramework**
--> Install it

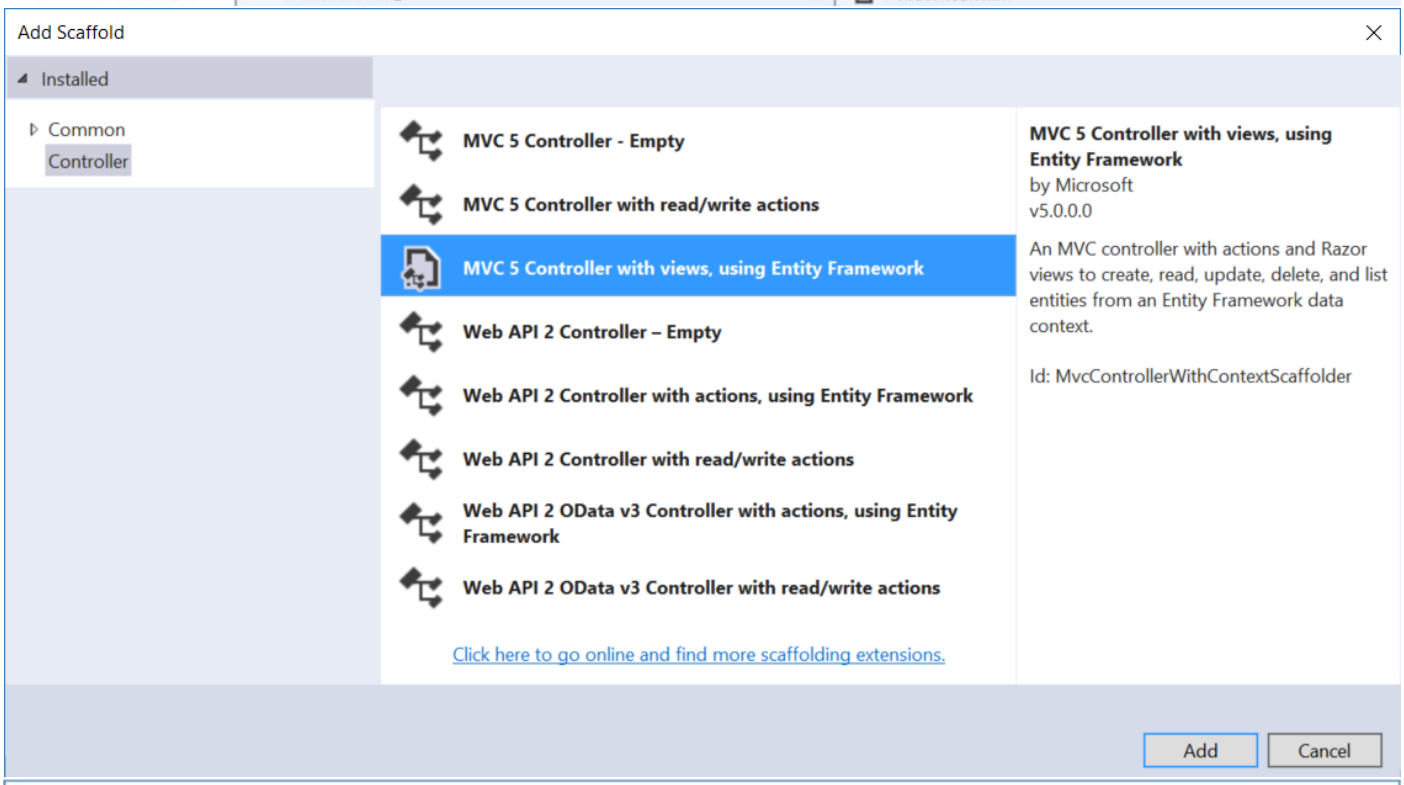


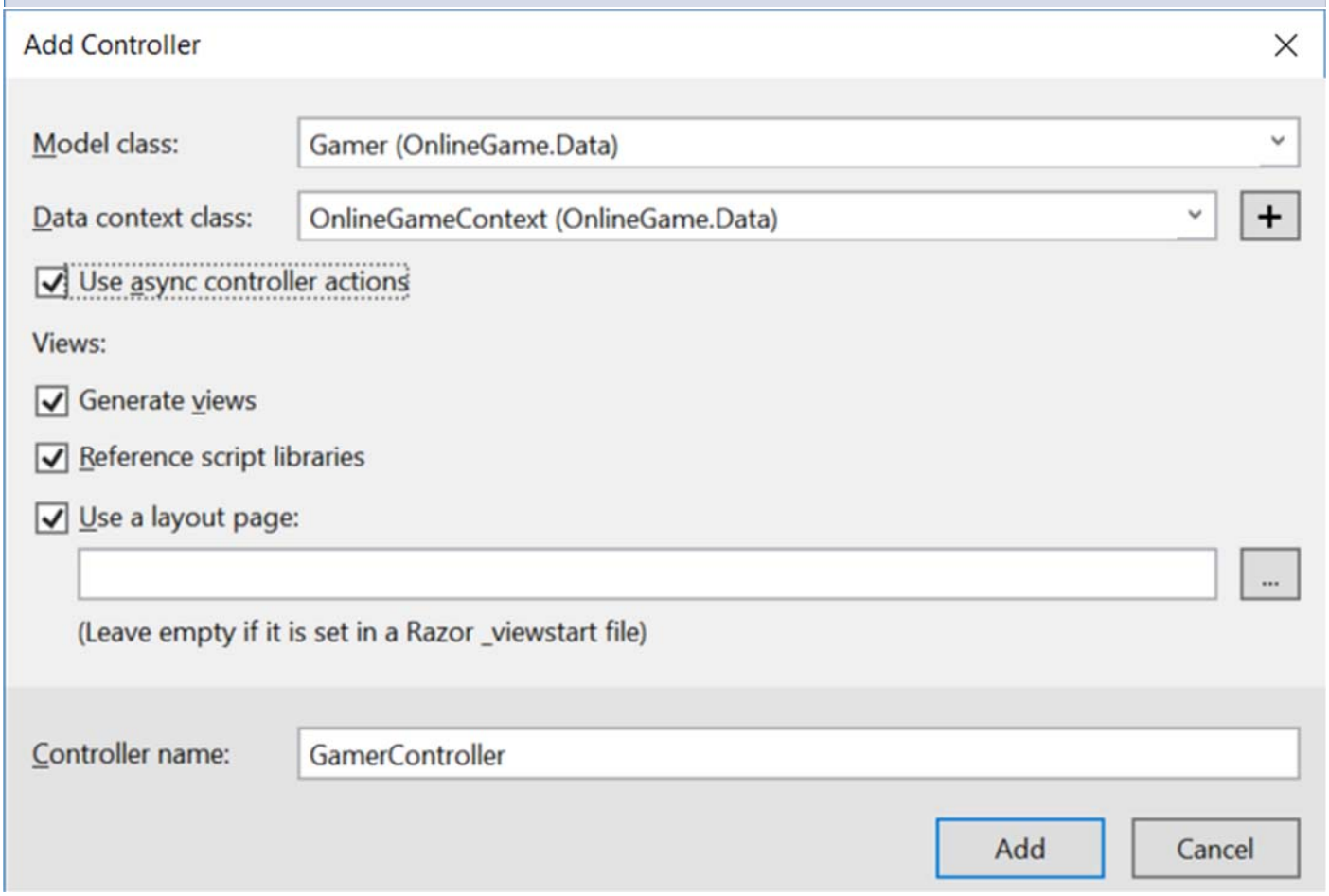
5.3. Web.config : Add Connection String

```
<connectionStrings>
<add name="OnlineGameContext" connectionString="metadata=res://*/OnlineGameDataModel.csdl|res://*/OnlineGameDataModel.ssdl|res://*/OnlineGameDataModel.msl;provider=System.Data.SqlClient;provider connection string=&quot;data source=N550JKL\SQL2016;initial catalog=OnineGame;persist security info=True;user id=Tester2;password=1234;MultipleActiveResultSets=True;App=EntityFramework&quot;" providerName="System.Data.EntityClient" />
</connectionStrings>
```

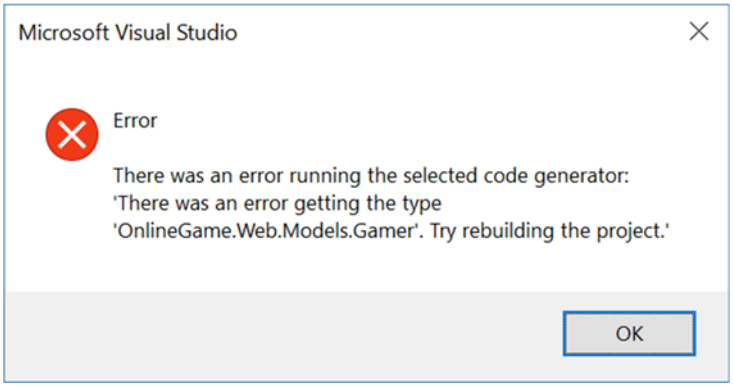
5.4. Controllers/GamerController.cs

Controllers --> Right click --> Add --> Controller
-->
MVC 5 Controller with views, using Entity Framework





It will automatically generate the controller, views, and several javascript and css files.
If you see the following error message, then you have to re-build solution before you create the controller.




```
using System.Data.Entity;
using System.Threading.Tasks;
using  System.Net;
using System.Web.Mvc;
using OnlineGame.Data;
namespace OnlineGame.Mvc.Controllers
{
    public class GamerController : Controller
    {
        private OnlineGameContext _db = new OnlineGameContext();
        // GET: Gamer
        [HttpGet]
        public async Task<ActionResult> Index()
        {
            return View(await _db.Gamers.ToListAsync());
        }
        [HttpGet]
        public ActionResult IndexWebApi()
        {
            return View();
        }
        [HttpGet]
        public ActionResult IndexWebApiJsonp()
        {
            return View();
        }
        [HttpGet]
        public ActionResult IndexWebApiCors()
        {
            return View();
        }
        // GET: Gamer/Details/5
        [HttpGet]
        public async Task<ActionResult> Details(int? id)
        {
            if (id == null) return new HttpStatusCodeResult(HttpStatusCode.BadRequest);
             Gamer gamer = await _db.Gamers.FindAsync(id);
            if (gamer == null) return HttpNotFound();
            return View(gamer);
        }
        // GET: Gamer/Create
        [HttpGet]
        public ActionResult Create()
        {
            return View();
        }
        // POST: Gamer/Create
```

```
        // To protect from overposting attacks, please enable the specific properties you want to bind to,
for
        // more details see https://go.microsoft.com/fwlink/?LinkId=317598.
        [HttpPost]
        [ValidateAntiForgeryToken]
        public async Task<ActionResult> Create([Bind(Include = "Id,Name,Gender,Score,GameMoney")] Gamer
gamer)
        {
            if (!ModelState.IsValid) return View(gamer);
            _db.Gamers.Add(gamer);
            await _db.SaveChangesAsync();
            return RedirectToAction("Index");
        }
        // GET: Gamer/Edit/5
        [HttpGet]
        public async Task<ActionResult> Edit(int? id)
        {
            if (id == null) return new HttpStatusCodeResult(HttpStatusCode.BadRequest);
            Gamer gamer = await _db.Gamers.FindAsync(id);
            if (gamer == null) return HttpNotFound();
            return View(gamer);
        }
        // POST: Gamer/Edit/5
        // To protect from overposting attacks, please enable the specific properties you want to bind to,
for
        // more details see https://go.microsoft.com/fwlink/?LinkId=317598.
        [HttpPost]
        [ValidateAntiForgeryToken]
        public async Task<ActionResult> Edit([Bind(Include = "Id,Name,Gender,Score,GameMoney")] Gamer
gamer)
        {
            if (!ModelState.IsValid) return View(gamer);
            _db.Entry(gamer).State = EntityState.Modified;
            await _db.SaveChangesAsync();
            return RedirectToAction("Index");
        }
        // GET: Gamer/Delete/5
        [HttpGet]
        public async Task<ActionResult> Delete(int? id)
        {
            if (id == null) return new HttpStatusCodeResult(HttpStatusCode.BadRequest);
            Gamer gamer = await _db.Gamers.FindAsync(id);
            if (gamer == null) return HttpNotFound();
            return View(gamer);
        }
        // POST: Gamer/Delete/5
        [HttpPost, ActionName("Delete")]
        [ValidateAntiForgeryToken]
        public async Task<ActionResult> DeleteConfirmed(int id)
        {
            Gamer gamer = await _db.Gamers.FindAsync(id);
            if (gamer != null) _db.Gamers.Remove(gamer);
            await _db.SaveChangesAsync();
            return RedirectToAction("Index");
        }
        protected override void Dispose(bool disposing)
        {
            if (disposing) _db.Dispose();
```

```
            base.Dispose(disposing);
        }
    }
}
```

5.5. Views/Gamer/IndexWebApi.cshtml

```
@{
    ViewBag.Title = "IndexWebApi";
}
<h2>IndexWebApi</h2>
<div>
    <input id="btnGamerList" type="button" value="Gamer List" />
    <input id="btnGamerTable" type="button" value="Gamer Table" />
    <input id="btnClear" type="button" value="Clear" />
    <ul id="ulGamers"></ul>
    <table id="tblGamers"></table>
</div>
<script src="~/Scripts/jquery-1.10.2.min.js"></script>
<script type="text/javascript">
    $(document).ready(function () {
        var ulGamers = $('#ulGamers');
        var tblGamers = $('#tblGamers');
        var gamerApiUrl = 'http://localhost:49789/api/gamer';
        //http://localhost:49789 is the domain of OnlineGame.WebApi project.
        //It supposed to call gamer api controller in OnlineGame.WebApi.
        //However, it will fails.
        //For security reason, web browsers do not allow
        //Jquery AJAX call Web API in the different origin/domain.
        $('#btnGamerList').click(function () {
            $.ajax({
                type: 'GET',
                url: gamerApiUrl,
                dataType: 'json',
                success: function (data) {
                    ulGamers.empty();
                    $.each(data, function (index, val) {
                        var name = val.Name;
                        ulGamers.append('<li>' + name + '</li>');
                    });
                }
            });
        });
        $('#btnGamerTable').click(function () {
            $.ajax({
                type: 'GET',
                url: gamerApiUrl,
                dataType: 'json',
                success: function (data) {
                    tblGamers.empty();
                    tblGamers.append('<tr><th>Id</th><th>Name</th><th>Gender</th><th>Score</th><th>GameMo
ney</th></tr>');
                    $.each(data, function (index, val) {
                        tblGamers.append('<tr>' +
                            '<td>' + val.Id + '</td>' +
                            '<td>' + val.Name + '</td>' +
```

```
                            '<td>' + val.Gender + '</td>' +
                            '<td>' + val.Score + '</td>' +
                            '<td>' + val.GameMoney + '</td>' +
                            '</tr>');
                        });
                    }
                });
            });
            $('#btnClear').click(function () {
                ulGamers.empty();
                tblGamers.empty();
            });
        });
</script>
```

6. OnlineGame.Mvc

6.1. JSONP allows Jquery AJAX may call Web API in the different origins

Reference:
https://github.com/WebApiContrib/WebApiContrib.Formatting.Jsonp
https://www.nuget.org/packages/WebApiContrib.Formatting.Jsonp/
For security reason, web browsers do not allow Jquery AJAX call Web API in the different origin.
There are 2 popular ways to fix it.
1.
JSONP (JSON with Padding) will wrap the JSON data in a function
Install-Package **WebApiContrib.Formatting.Jsonp**
E.g.1.1. JSON

```
{
   "Name":"KL",
    "Gender":"Male"
}
```

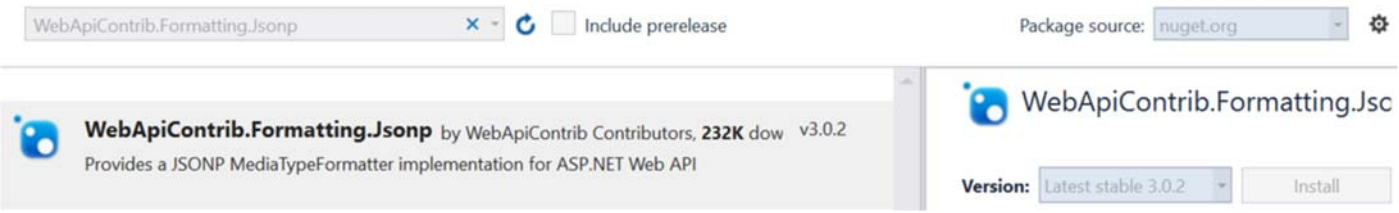
E.g.1.2. JSONP

```
CallbackFunction({
   "Name":"KL",
    "Gender":"Male"
})
```

2.
Enable CORS (Cross Origin Resource Sharing)
Install-Package **Microsoft.AspNet.WebApi.Cors**

6.2. Install JSONP

In OnlineGame.WebApi project
Install-Package WebApiContrib.Formatting.Jsonp



6.3. OnlineGame.WebApi/App_Start/WebApiConfig.cs

```
using System.Web.Http;
using WebApiContrib.Formatting.Jsonp;
namespace OnlineGame.WebApi
{
    public static class WebApiConfig
    {
        public static void Register(HttpConfiguration config)
        {
            // Web API configuration and services
            // Web API routes
            config.MapHttpAttributeRoutes();
            config.Routes.MapHttpRoute(
                name: "DefaultApi",
                routeTemplate: "api/{controller}/{id}",
                defaults: new { id = RouteParameter.Optional }
            );
            //Create a new JSON media type formatter,
            //and insert it into first position of HttpConfiguration formatter.
            //It will allow you to use JSONP formatter which
            //can wrap the JSON data in a function
            JsonpMediaTypeFormatter jsonpFormatter =
                new JsonpMediaTypeFormatter(config.Formatters.JsonFormatter);
            config.Formatters.Insert(0, jsonpFormatter);
        }
    }
}
/*
1.
JSONP allows Jquery AJAX may call Web API in the different origins
//JsonpMediaTypeFormatter jsonpFormatter =
//    new JsonpMediaTypeFormatter(config.Formatters.JsonFormatter);
//config.Formatters.Insert(0, jsonpFormatter);
Create a new JSON media type formatter,
and insert it into first position of HttpConfiguration formatter.
It will allow you to use JSONP formatter which
can wrap the JSON data in a function
E.g.1.1. JSON
{
    "Name":"KL",
     "Gender":"Male"
}
E.g.1.2. JSONP
CallbackFunction({
    "Name":"KL",
     "Gender":"Male"
})
*/
```

6.4. OnlineGame.Mvc/Views/Gamer/IndexWebApiJsonp.cshtml

```
@{
    ViewBag.Title = "IndexWebApiJsonp";
}
<h2>IndexWebApiJsonp</h2>
<div>
    <input id="btnGamerList" type="button" value="Gamer List" />
    <input id="btnGamerTable" type="button" value="Gamer Table" />
    <input id="btnClear" type="button" value="Clear" />
    <ul id="ulGamers"></ul>
    <table id="tblGamers"></table>
</div>
<script src="~/Scripts/jquery-1.10.2.min.js"></script>
<script type="text/javascript">
    $(document).ready(function () {
        var ulGamers = $('#ulGamers');
        var tblGamers = $('#tblGamers');
        var gamerdatatype = 'jsonp';
        var gamerApiUrl = 'http://localhost:49789/api/gamer';
        //http://localhost:49789 is the domain of OnlineGame.WebApi project.
        //It supposed to call gamer api controller in OnlineGame.WebApi.
        //However, it will fails.
        //For security reason, web browsers do not allow
        //Jquery AJAX call Web API in the different origin/domain.
        //There are 2 popular ways to fix it.
        //1.
        //JSONP (JSON with Padding) will wrap the JSON data in a function
        //2.
        //Enable CORS (Cross Origin Resource Sharing)
        //Here, we will use JSONP to fix the issue.
        $('#btnGamerList').click(function () {
            $.ajax({
                type: 'GET',
                url: gamerApiUrl,
                dataType: gamerdatatype,
                success: function (data) {
                    ulGamers.empty();
                    $.each(data, function (index, val) {
                        var name = val.Name;
                        ulGamers.append('<li>' + name + '</li>');
                    });
                }
            });
        });
        $('#btnGamerTable').click(function () {
            $.ajax({
                type: 'GET',
                url: gamerApiUrl,
                dataType: gamerdatatype,
                success: function (data) {
                    tblGamers.empty();
                    tblGamers.append('<tr><th>Id</th><th>Name</th><th>Gender</th><th>Score</th><th>GameMo
ney</th></tr>');
                    $.each(data, function (index, val) {
                        tblGamers.append('<tr>' +
                            '<td>' + val.Id + '</td>' +
                            '<td>' + val.Name + '</td>' +
                            '<td>' + val.Gender + '</td>' +
```

```
                        '<td>' + val.Score + '</td>' +
                        '<td>' + val.GameMoney + '</td>' +
                        '</tr>');
                    });
                }
            });
        });
        $('#btnClear').click(function () {
            ulGamers.empty();
            tblGamers.empty();
        });
    });
</script>
```

http://localhost:49804/Gamer/IndexWebApiJsonp

IndexWebApiJsonp

Gamer List | Gamer Table | Clear

- NameOne ABC
- NameTwo ABCDE
- NameThree EFGH
- NameFour HIJKLMN
- NameFive NOP
- NameSix PQRSTUVW
- NameSeven XYZ

Id	Name	Gender	Score	GameMoney
1	NameOne ABC	Male	5000	550
2	NameTwo ABCDE	Female	4500	1200
3	NameThree EFGH	Male	6500	3050
4	NameFour HIJKLMN	Female	45000	450
5	NameFive NOP	Male	3000	200
6	NameSix PQRSTUVW	Male	4000	700
7	NameSeven XYZ	Male	450	1500

6.5. OnlineGame.WebApi/Views/Gamer/Index2.cshtml

```
@{
    ViewBag.Title = "Index2";
}
<h2>Index2</h2>
<div>
    <input id="btnGamerList" type="button" value="Gamer List" />
    <input id="btnGamerTable" type="button" value="Gamer Table" />
```

```
    <input id="btnClear" type="button" value="Clear" />
    <ul id="ulGamers"></ul>
    <table id="tblGamers"></table>
</div>
<script src="~/Scripts/jquery-1.10.2.min.js"></script>
<script type="text/javascript">
    $(document).ready(function () {
        var ulGamers = $('#ulGamers');
        var tblGamers = $('#tblGamers');
        var gamerdatatype = 'jsonp';
        var gamerApiUrl = '/api/gamer/';
        $('#btnGamerList').click(function () {
            $.ajax({
                type: 'GET',
                url: gamerApiUrl,
                dataType: gamerdatatype,
                success: function (data) {
                    ulGamers.empty();
                    $.each(data, function (index, val) {
                        var name = val.Name;
                        ulGamers.append('<li>' + name + '</li>');
                    });
                }
            });
        });
        $('#btnGamerTable').click(function () {
            $.ajax({
                type: 'GET',
                url: gamerApiUrl,
                dataType: gamerdatatype,
                success: function (data) {
                    tblGamers.empty();
                    tblGamers.append('<tr><th>Id</th><th>Name</th><th>Gender</th><th>Score</th><th>GameMo
ney</th></tr>');
                    $.each(data, function (index, val) {
                        tblGamers.append('<tr>' +
                            '<td>' + val.Id + '</td>' +
                            '<td>' + val.Name + '</td>' +
                            '<td>' + val.Gender + '</td>' +
                            '<td>' + val.Score + '</td>' +
                            '<td>' + val.GameMoney + '</td>' +
                            '</tr>');
                    });
                }
            });
        });
        $('#btnClear').click(function () {
            ulGamers.empty();
            tblGamers.empty();
        });
    });
</script>
```

http://localhost:49789/gamer/index2

Index2

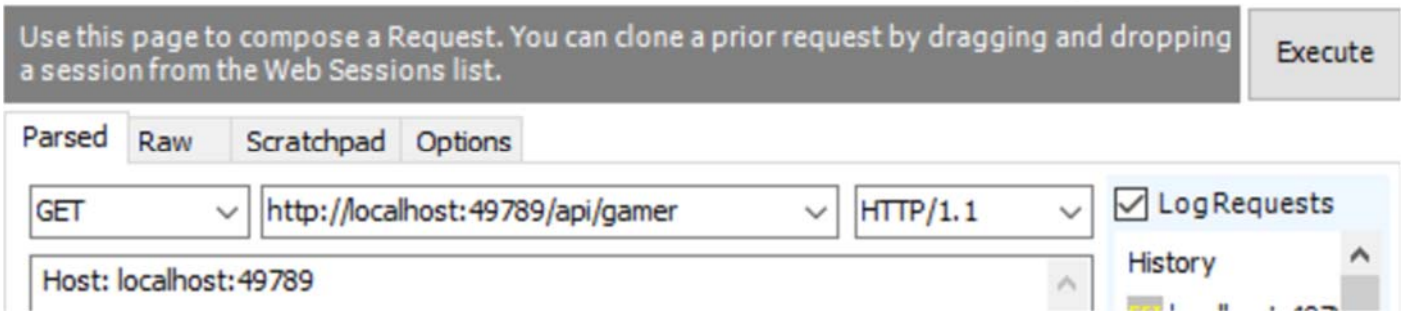
Gamer List | Gamer Table | Clear

- NameOne ABC
- NameTwo ABCDE
- NameThree EFGH
- NameFour HIJKLMN
- NameFive NOP
- NameSix PQRSTUVW
- NameSeven XYZ

Id	Name	Gender	Score	GameMoney
1	NameOne ABC	Male	5000	550
2	NameTwo ABCDE	Female	4500	1200
3	NameThree EFGH	Male	6500	3050
4	NameFour HIJKLMN	Female	45000	450
5	NameFive NOP	Male	3000	200
6	NameSix PQRSTUVW	Male	4000	700
7	NameSeven XYZ	Male	450	1500

6.6. Fiddler test Jsonp

1.
http://localhost:49789/api/gamer
Request header:
Host: localhost:49789
-->
Response
HTTP/1.1 500 Internal Server Error



-->

#	Result	Protocol	Host	URL
1	500	HTTP	localhost:49789	/api/gamer

2.

http://localhost:49789/api/gamer?callback=AAA

Request header:

Host: localhost:49789

-->

Response

200

Raw Json data wrapped by AAA function.

Use this page to compose a Request. You can clone a prior request by dragging and dropping a session from the Web Sessions list.

Execute

Parsed | Raw | Scratchpad | Options

GET | http://localhost:49789/api/gamer?callback=AAA | HTTP/1.1 | Log Requests

Host: localhost:49789

History

-->

#	Result	Protocol	Host	URL
2	200	HTTP	localhost:49789	/api/gamer?callback=AAA

-->

Request Headers [Raw] [Header Definitions]

GET /api/gamer?callback=AAA HTTP/1.1

Transport

Host: localhost:49789

Transformer | Headers | TextView | SyntaxView | ImageView | HexView | WebView | Auth | Caching

Cookies | Raw | JSON | XML


```
/**/ typeof AAA === 'function' && AAA([{"Id":1,"Name":"NameOne ABC","Gender":"
Male","Score":5000,"GameMoney":550},{"Id":2,"Name":"NameTwo ABCDE","Gender":"
Female","Score":4500,"GameMoney":1200},{"Id":3,"Name":"NameThree EFGH","Gender":"
Male","Score":6500,"GameMoney":3050},{"Id":4,"Name":"NameFour HIJKLMN","Gender":"
Female","Score":45000,"GameMoney":450},{"Id":5,"Name":"NameFive NOP","Gender":"
Male","Score":3000,"GameMoney":200},{"Id":6,"Name":"NameSix PQRSTUVW","Gender":"
Male","Score":4000,"GameMoney":700},{"Id":7,"Name":"NameSeven XYZ","Gender":"Male"
,"Score":450,"GameMoney":1500}]);
```

3.

http://localhost:49789/api/gamer

Request header:

Host: localhost:49789

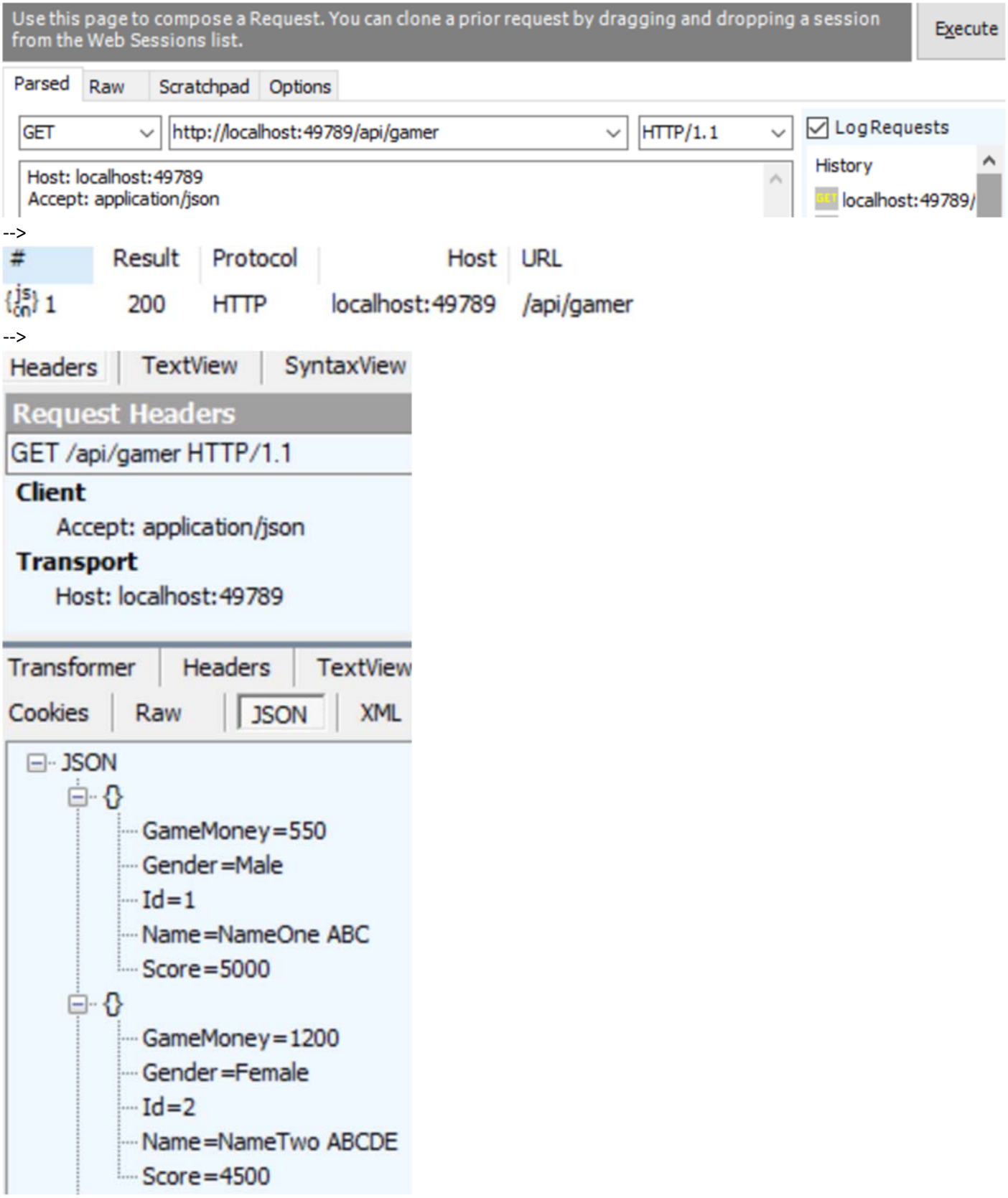
Accept: application/json

-->

Response

200

The json data.



7. OnlineGame.Mvc

7.1. WebApi Cors (Cross Origin Resource Sharing) allows Jquery AJAX may call Web API in the different origins

Reference:
https://docs.microsoft.com/en-us/aspnet/web-api/overview/security/enabling-cross-origin-requests-in-web-api
https://www.nuget.org/packages/Microsoft.AspNet.WebApi.Cors/
For security reason, web browsers do not allow Jquery AJAX call Web API in the different origin.
There are 2 popular ways to fix it.
1.
JSONP (JSON with Padding) will wrap the JSON data in a function
Install-Package **WebApiContrib.Formatting.Jsonp**
E.g.1.1. JSON

```
{
   "Name":"KL",
    "Gender":"Male"
}
```

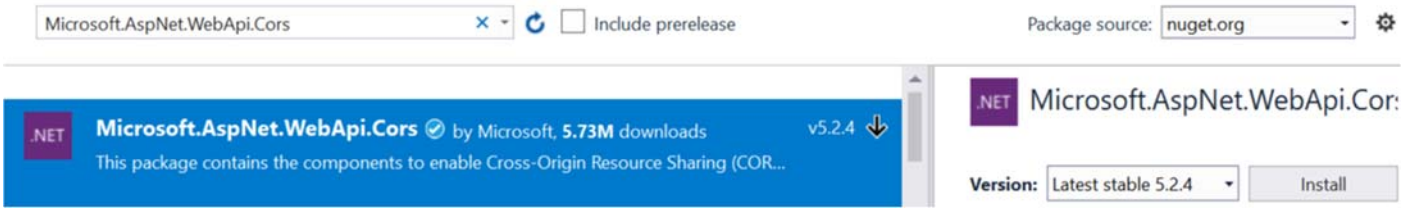
E.g.1.2. JSONP

```
CallbackFunction({
   "Name":"KL",
    "Gender":"Male"
})
```

2.
Enable CORS (Cross Origin Resource Sharing)
Install-Package Microsoft.AspNet.WebApi.Cors

7.2. Install WebApi Cors

Install-Package Microsoft.AspNet.WebApi.Cors



7.3. OnlineGame.WebApi/App_Start/WebApiConfig.cs

```
using System.Web.Http;
using System.Web.Http.Cors;
using WebApiContrib.Formatting.Jsonp;
namespace OnlineGame.WebApi
{
    public static class WebApiConfig
    {
        public static void Register(HttpConfiguration config)
        {
            // Web API configuration and services
            // Web API routes
            config.MapHttpAttributeRoutes();
            config.Routes.MapHttpRoute(
                name: "DefaultApi",
                routeTemplate: "api/{controller}/{id}",
                defaults: new { id = RouteParameter.Optional }
            );
```

```
            ////1.
            ////JSONP allows Jquery AJAX may call Web API in the different origins
            ////Create a new JSON media type formatter,
            ////and insert it into first position of HttpConfiguration formatter.
            ////It will allow you to use JSONP formatter which
            ////can wrap the JSON data in a function
            //JsonpMediaTypeFormatter jsonpFormatter =
            //    new JsonpMediaTypeFormatter(config.Formatters.JsonFormatter);
            //config.Formatters.Insert(0, jsonpFormatter);
            ////2.
            ////WebApi Cors(Cross Origin Resource Sharing)
            ////allows Jquery AJAX may call Web API in the different origins
            ////2.1.
            ////EnableCorsAttribute(origins, headers, methods)
            ////It allows the resource to be accessed by all origins,
            ////and it accepts any request header ("accept,content-type,origin...etc"),
            ////and it accepts all methods ("GET,POST...etc")
            //EnableCorsAttribute cors = new EnableCorsAttribute("*", "*", "*");
            //config.EnableCors(cors);
            //2.2.
             config.EnableCors();
        }
    }
}
/*
1.
JSONP allows Jquery AJAX may call Web API in the different origins
//JsonpMediaTypeFormatter jsonpFormatter =
//    new JsonpMediaTypeFormatter(config.Formatters.JsonFormatter);
//config.Formatters.Insert(0, jsonpFormatter);
Create a new JSON media type formatter,
and insert it into first position of HttpConfiguration formatter.
It will allow you to use JSONP formatter which
can wrap the JSON data in a function
E.g.1.1. JSON
{
    "Name":"KL",
     "Gender":"Male"
}
E.g.1.2. JSONP
CallbackFunction({
    "Name":"KL",
     "Gender":"Male"
})
-------------------------------------
3.
WebApi Cors (Cross Origin Resource Sharing)
allows Jquery AJAX may call Web API in the different origins
------------------------------
3.1.
new EnableCorsAttribute(origins, headers, methods)
//EnableCorsAttribute cors = new EnableCorsAttribute("*", "*", "*");
//config.EnableCors(cors);
It allows the resource to be accessed by all origins,
and it accepts any request header ("accept,content-type,origin...etc"),
and it accepts all methods ("GET,POST...etc")
----------------
3.1.1.
origins:
It is a Comma-separated whitelist which are allowed to access the web api by Ajax call.
E.g.3.1.1.1.
"http://localhost:49804,https://ithandyguytutorial.blogspot.com.au"
```

```
That means only http://localhost:49804 and https://ithandyguytutorial.blogspot.com.au
can access the web api by Ajax call.
E.g.3.1.1.2.
"*"
It means allows all origins to access the web api by Ajax call.
----------------
3.1.2.
headers:
It is a Comma-separated whitelist of request headers which are supported by the resource.
E.g.3.1.2.1.
"accept,content-type,origin" means only these 3 things can be used in request header.
E.g.3.1.2.2.
"*"
It means allows all request headers to the web api by Ajax call.
----------------
3.1.3.
methods:
It is a Comma-separated whitelist of methods which are supported by the resource.
E.g.3.1.3.1.
"GET,POST" means only these 2 methods can be used in request.
E.g.3.1.3.2.
"*"
It means allows all request methods to the web api by Ajax call.
-------------------------------
3.2.
In OnlineGame.WebApi/App_Start/WebApiConfig.cs
//config.EnableCors();
In OnlineGame.WebApi/Controllers/Api/GamerController.cs
////[EnableCors("*", "*", "*")]
////[EnableCors("https://ithandyguytutorial.blogspot.com.au", "*", "*")]
//[EnableCors("http://localhost:49804", "*", "*")]
//public class GamerController : ApiController
...
//[DisableCors]
//[HttpGet]
//public async Task<IHttpActionResult> LoadGamers(string gender = "")
3.2.1.
If you don't want to enable Cors globally,
then you may enable Cors in api controller level or method level.
When you enable Cors, in api controller level,
//[EnableCors("*", "*", "*")]
it will apply to all methods in that controller.
If you want to exclude any method, then you may use
//[DisableCors]
3.2.2.
3.2.2.1.
//[EnableCors("*", "*", "*")]
EnableCorsAttribute(origins, headers, methods)
It allows the resource to be accessed by all origins,
and it accepts any request header ("accept,content-type,origin...etc"),
and it accepts all methods ("GET,POST...etc")
3.2.2.2.
//[EnableCors("https://ithandyguytutorial.blogspot.com.au", "*", "*")]
EnableCorsAttribute(origins, headers, methods)
It allows the resource to be accessed by https://ithandyguytutorial.blogspot.com.au origins,
and it accepts any request header ("accept,content-type,origin...etc"),
and it accepts all methods ("GET,POST...etc")
3.2.2.3.
//[EnableCors("http://localhost:49804", "*", "*")]
It allows the resource to be accessed by http://localhost:49804 origins,
and it accepts any request header ("accept,content-type,origin...etc"),
and it accepts all methods ("GET,POST...etc")
*/
```

7.4. OnlineGame.WebApi/Controllers/Api/GamerController.cs

```
using System.Collections.Generic;
using System.Data.Entity;
using System.Data.Entity.Infrastructure;
using System.Linq;
using System.Threading.Tasks;
using System.Web.Http;
using System.Web.Http.Cors;
using System.Web.Http.Description;
using OnlineGame.Data;
namespace OnlineGame.WebApi.Controllers.Api
{
    //[EnableCors("*", "*", "*")]
    //[EnableCors("https://ithandyguytutorial.blogspot.com.au", "*", "*")]
     [EnableCors("http://localhost:49804", "*", "*")]
    public class GamerController : ApiController
     {
        private OnlineGameContext _db = new OnlineGameContext();
        ////GET: api/Gamer
        //[HttpGet]
        //public IQueryable<Gamer> LoadGamers()
        ////public IQueryable<Gamer> GetGamers()
        //{
        //    return _db.Gamers;
        //}
        //GET: api/gamer?gender=female  --> Only Female Gamer
        //GET: api/gamer? gender = male-- > Only Male Gamer
        //GET: api/gamer --> All Gamers
        //[DisableCors]
         [HttpGet]
        public async Task<IHttpActionResult> LoadGamers(string gender = "")
        //public IQueryable<Gamer> GetGamers()
         {
             List<Gamer> gamers;
            switch (gender.ToLower())
             {
                 case "male":
                     gamers = await _db.Gamers.Where(g => g.Gender.ToLower() == "male").ToListAsync();
                    break;
                 case "female":
                     gamers = await _db.Gamers.Where(g => g.Gender.ToLower() == "female").ToListAsync();
                    break;
                 default:
                     gamers = await _db.Gamers.ToListAsync();
                    break;
             }
            return Ok(gamers);   //200
         }
        // GET: api/Gamer/5
         [ResponseType(typeof(Gamer))]
         [HttpGet]
        public async Task<IHttpActionResult> LoadGamer(int id)
        //public async Task<IHttpActionResult> GetGamer(int id)
         {
             Gamer gamer = await _db.Gamers.FindAsync(id);
```

```
            if (gamer == null) return NotFound();  //404
            return Ok(gamer);   //200
        }
        // PUT: api/Gamer/5
        [ResponseType(typeof(void))]
        //public async Task<IHttpActionResult> PutGamer(int id, Gamer gamer)
        [HttpPut]
        //public async Task<IHttpActionResult> UpdateGamer(int id, Gamer gamer)
        public async Task<IHttpActionResult> UpdateGamer([FromUri]int id, [FromBody]Gamer gamer)    //By
Default
        //public async Task<IHttpActionResult> UpdateGamer([FromBody]int id, [FromUri]Gamer gamer)
        {
            if (!ModelState.IsValid) return BadRequest(ModelState);  //400
            //if (id != gamer.Id)   return BadRequest();
            //1.
             gamer.Id = id;
             _db.Entry(gamer).State = EntityState.Modified;  //update the gamer
            //2.
            //Gamer currentGamer = await _db.Gamers.FirstOrDefaultAsync(g => g.Id == id);
            //if (currentGamer == null) return NotFound();  //404
            //currentGamer.Name = gamer.Name;
            //currentGamer.Gender = gamer.Gender;
            //currentGamer.Score = gamer.Score;
            //currentGamer.GameMoney = gamer.GameMoney;
            try
             {
                 await _db.SaveChangesAsync();
                 return Ok();    //200
             }
            catch (DbUpdateConcurrencyException)
             {
                 if (!GamerExists(id)) return NotFound();  //404
                 throw;
             }
        }
        // POST: api/Gamer
        [ResponseType(typeof(Gamer))]
        [HttpPost]
        public async Task<IHttpActionResult> InsertGamer([FromBody]Gamer gamer)
        //public async Task<IHttpActionResult> PostGamer([FromBody]Gamer gamer)
        {
            if (!ModelState.IsValid) return BadRequest(ModelState); //400
             _db.Gamers.Add(gamer);
            await _db.SaveChangesAsync();
            //Return Created/201.
            //1.
            return CreatedAtRoute("DefaultApi", new { id = gamer.Id }, gamer);    //Created/201
            ////Return Created/201.
            ////2.
            ////If you want to return HttpResponseMessage()
            ////2.
            ////Create a HttpResponseMessage with status code 201 Item Created.
            ////Pass the gamer into 2nd parameter as the created value.
            //HttpResponseMessage message =
            //    Request.CreateResponse(HttpStatusCode.Created, gamer);
            ////The Headers.Location should know the URI of the created item.
```

```
            //message.Headers.Location = new Uri(Request.RequestUri +
            //    gamer.Id.ToString());
            //return message;   //Created/201
            ////Return OK/200.
            ////3.
            ////if you want to return OK/200 when item created.
            //return Created(new Uri(Request.RequestUri + gamer.Id.ToString()), gamer);    //OK/200
        }
        // DELETE: api/Gamer/5
        [ResponseType(typeof(Gamer))]
        //[HttpDelete]
        //public async Task<IHttpActionResult> RemoveGamer(Gamer gamer)
        public async Task<IHttpActionResult> DeleteGamer(int id)
        {
            Gamer gamer = await _db.Gamers.FindAsync(id);
            if (gamer == null) return NotFound();   //404
            _db.Gamers.Remove(gamer);
            await _db.SaveChangesAsync();
            return Ok(gamer);   //200
        }
        protected override void Dispose(bool disposing)
        {
            if (disposing) _db.Dispose();   //Dispose DBContext
            base.Dispose(disposing);
        }
        private bool GamerExists(int id)
        {
            return _db.Gamers.Count(e => e.Id == id) > 0;
        }
    }
}

/*
1.
1.1.
By default, the HTTP verb GET maps to a method that has the name Get() or "Get" prefix.
E.g. Get(), GetGamers, GetXXX()
If you want the HTTP verb GET maps to the method name without "Get" prefix.
You can use [HttpGet] attribute.
1.2.
[HttpGet] attribute maps HTTP verb GET.
[HttpPost] attribute maps HTTP verb POST.
[HttpPut] attribute maps HTTP verb PUT.
[HttpDelete] attribute maps HTTP verb DELETE.
----------------------------
2.
[FromUri] V.S. [FromBody]
Web Api default binding parameter convention
2.1.
By default, if the parameter is a simple type,
Web Api will try to get value from uri.
E.g. int, double, bool, ...etc.
2.2.
By default, if the parameter is a complex type,
Web Api will try to get value from the request body.
E.g. Gamer
-----------------
2.3.
//[HttpPut]
//public async Task<IHttpActionResult> UpdateGamer(int id, Gamer gamer)
By Default, the Web Api will try to get id from uri, and gamer from request body as below code.
//[HttpPut]
```

//public async Task<IHttpActionResult> UpdateGamer([FromUri]int id, [FromBody]Gamer gamer)
E.g.
A.
PUT
http://localhost:58302/api/Gamer/8
B.
Request Header
Host: localhost:58302
Content-Type: application/json
B.1.
Accept: application/json
means we request JSON format response.
B.2.
Content-Type: application/json
The client will post a data to the server, the data format is JSON
C.
Request Body
{
"Name":"NameEight XYZ222",
"Gender":"Male",
"Score":450,
"GameMoney":1500
}

2.4.
//[HttpPut]
//public async Task<IHttpActionResult> UpdateGamer([FromBody]int id, [FromUri]Gamer gamer)
[FromBody] will enfroce to get id from request body
[FromUri] will enforce to get gamer from uri
E.g.
A.
PUT
http://localhost:58302/api/Gamer?Name=NameEight%20XYZ333&Gender=Male&Score=450&GameMoney=1500
B.
Request Header
Host: localhost:58302
Content-Type: application/json
B.1.
Accept: application/json
means we request JSON format response.
B.2.
Content-Type: application/json
The client will post a data to the server, the data format is JSON
C.
Request Body
8

3.
WebApi Cors (Cross Origin Resource Sharing)
allows Jquery AJAX may call Web API in the different origins

3.1.
new EnableCorsAttribute(origins, headers, methods)
//EnableCorsAttribute cors = new EnableCorsAttribute("*", "*", "*");
//config.EnableCors(cors);
It allows the resource to be accessed by all origins,
and it accepts any request header ("accept,content-type,origin...etc"),
and it accepts all methods ("GET,POST...etc")

3.1.1.
origins:
It is a Comma-separated whitelist which are allowed to access the web api by Ajax call.
E.g.3.1.1.1.
"http://localhost:49804,https://ithandyguytutorial.blogspot.com.au"
That means only http://localhost:49804 and https://ithandyguytutorial.blogspot.com.au
can access the web api by Ajax call.
E.g.3.1.1.2.

```
"*"
It means allows all origins to access the web api by Ajax call.
----------------
3.1.2.
headers:
It is a Comma-separated whitelist of request headers which are supported by the resource.
E.g.3.1.2.1.
"accept,content-type,origin" means only these 3 things can be used in request header.
E.g.3.1.2.2.
"*"
It means allows all request headers to the web api by Ajax call.
----------------
3.1.3.
methods:
It is a Comma-separated whitelist of methods which are supported by the resource.
E.g.3.1.3.1.
"GET,POST" means only these 2 methods can be used in request.
E.g.3.1.3.2.
"*"
It means allows all request methods to the web api by Ajax call.
-------------------------------
3.2.
In OnlineGame.WebApi/App_Start/WebApiConfig.cs
//config.EnableCors();
In OnlineGame.WebApi/Controllers/Api/GamerController.cs
////[EnableCors("*", "*", "*")]
////[EnableCors("https://ithandyguytutorial.blogspot.com.au", "*", "*")]
//[EnableCors("http://localhost:49804", "*", "*")]
//public class GamerController : ApiController
...
//[DisableCors]
//[HttpGet]
//public async Task<IHttpActionResult> LoadGamers(string gender = "")
3.2.1.
If you don't want to enable Cors globally,
then you may enable Cors in api controller level or method level.
When you enable Cors, in api controller level,
//[EnableCors("*", "*", "*")]
it will apply to all methods in that controller.
If you want to exclude any method, then you may use
//[DisableCors]
3.2.2.
3.2.2.1.
//[EnableCors("*", "*", "*")]
EnableCorsAttribute(origins, headers, methods)
It allows the resource to be accessed by all origins,
and it accepts any request header ("accept,content-type,origin...etc"),
and it accepts all methods ("GET,POST...etc")
3.2.2.2.
//[EnableCors("https://ithandyguytutorial.blogspot.com.au", "*", "*")]
EnableCorsAttribute(origins, headers, methods)
It allows the resource to be accessed by https://ithandyguytutorial.blogspot.com.au origins,
and it accepts any request header ("accept,content-type,origin...etc"),
and it accepts all methods ("GET,POST...etc")
3.2.2.3.
//[EnableCors("http://localhost:49804", "*", "*")]
It allows the resource to be accessed by http://localhost:49804 origins,
and it accepts any request header ("accept,content-type,origin...etc"),
and it accepts all methods ("GET,POST...etc")
*/
```

7.5. OnlineGame.WebApi/Views/Gamer/Index2.cshtml

```
@{
    ViewBag.Title = "Index2";
```

```
}
<h2>Index2</h2>
<div>
    <input id="btnGamerList" type="button" value="Gamer List" />
    <input id="btnGamerTable" type="button" value="Gamer Table" />
    <input id="btnClear" type="button" value="Clear" />
    <ul id="ulGamers"></ul>
    <table id="tblGamers"></table>
</div>
<script src="~/Scripts/jquery-1.10.2.min.js"></script>
<script type="text/javascript">
    $(document).ready(function () {
        var ulGamers = $('#ulGamers');
        var tblGamers = $('#tblGamers');
        //var gamerdatatype = 'jsonp';
        var gamerdatatype = 'json';
        var gamerApiUrl = '/api/gamer/';
        $('#btnGamerList').click(function () {
            $.ajax({
                type: 'GET',
                url: gamerApiUrl,
                dataType: gamerdatatype,
                success: function (data) {
                    ulGamers.empty();
                    $.each(data, function (index, val) {
                        var name = val.Name;
                        ulGamers.append('<li>' + name + '</li>');
                    });
                }
            });
        });
        $('#btnGamerTable').click(function () {
            $.ajax({
                type: 'GET',
                url: gamerApiUrl,
                dataType: gamerdatatype,
                success: function (data) {
                    tblGamers.empty();
                    tblGamers.append('<tr><th>Id</th><th>Name</th><th>Gender</th><th>Score</th><th>GameMo
ney</th></tr>');
                    $.each(data, function (index, val) {
                        tblGamers.append('<tr>' +
                            '<td>' + val.Id + '</td>' +
                            '<td>' + val.Name + '</td>' +
                            '<td>' + val.Gender + '</td>' +
                            '<td>' + val.Score + '</td>' +
                            '<td>' + val.GameMoney + '</td>' +
                            '</tr>');
                    });
                }
            });
        });
        $('#btnClear').click(function () {
            ulGamers.empty();
            tblGamers.empty();
        });
    });
</script>
```

7.6. OnlineGame.Mvc/Views/Gamer/IndexWebApiCors.cshtml

```
@{
    ViewBag.Title = "IndexWebApiJsonp";
}
<h2>IndexWebApiJsonp</h2>
<div>
    <input id="btnGamerList" type="button" value="Gamer List" />
    <input id="btnGamerTable" type="button" value="Gamer Table" />
    <input id="btnClear" type="button" value="Clear" />
    <ul id="ulGamers"></ul>
    <table id="tblGamers"></table>
</div>
<script src="~/Scripts/jquery-1.10.2.min.js"></script>
<script type="text/javascript">
    $(document).ready(function () {
        var ulGamers = $('#ulGamers');
        var tblGamers = $('#tblGamers');
        //var gamerdatatype = 'jsonp';
        var gamerdatatype = 'json';
        var gamerApiUrl = 'http://localhost:49789/api/gamer';
        //http://localhost:49789 is the domain of OnlineGame.WebApi project.
        //It supposed to call gamer api controller in OnlineGame.WebApi.
        //However, it will fails.
        //For security reason, web browsers do not allow
        //Jquery AJAX call Web API in the different origin/domain.
        //There are 2 popular ways to fix it.
        //1.
        //JSONP (JSON with Padding) will wrap the JSON data in a function
        //2.
        //Enable CORS (Cross Origin Resource Sharing)
        //Here, we will use JSONP to fix the issue.
        $('#btnGamerList').click(function () {
            $.ajax({
                type: 'GET',
                url: gamerApiUrl,
                dataType: gamerdatatype,
                success: function (data) {
                    ulGamers.empty();
                    $.each(data, function (index, val) {
                        var name = val.Name;
                        ulGamers.append('<li>' + name + '</li>');
                    });
                }
            });
        });
        $('#btnGamerTable').click(function () {
            $.ajax({
                type: 'GET',
                url: gamerApiUrl,
                dataType: gamerdatatype,
                success: function (data) {
                    tblGamers.empty();
                    tblGamers.append('<tr><th>Id</th><th>Name</th><th>Gender</th><th>Score</th><th>GameMo
ney</th></tr>');
                    $.each(data, function (index, val) {
```

```
                        tblGamers.append('<tr>' +
                            '<td>' + val.Id + '</td>' +
                            '<td>' + val.Name + '</td>' +
                            '<td>' + val.Gender + '</td>' +
                            '<td>' + val.Score + '</td>' +
                            '<td>' + val.GameMoney + '</td>' +
                            '</tr>');
                    });
                }
            });
        });
        $('#btnClear').click(function () {
            ulGamers.empty();
            tblGamers.empty();
        });
    });
</script>
```

7.7. Fiddler test CORS (Cross Origin Resource Sharing)

3.2.
In OnlineGame.WebApi/App_Start/WebApiConfig.cs
//config.EnableCors();
In OnlineGame.WebApi/Controllers/Api/GamerController.cs
////[EnableCors("*", "*", "*")]
////[EnableCors("https://ithandyguytutorial.blogspot.com.au", "*", "*")]
//[EnableCors("http://localhost:49804", "*", "*")]
//public class GamerController : ApiController
...
//[DisableCors]
//[HttpGet]
//public async Task<IHttpActionResult> LoadGamers(string gender = "")
3.2.1.
If you don't want to enable Cors globally,
then you may enable Cors in api controller level or method level.
When you enable Cors, in api controller level,
//[EnableCors("*", "*", "*")]
it will apply to all methods in that controller.
If you want to exclude any method, then you may use
//[DisableCors]
3.2.2.
3.2.2.1.
//[EnableCors("*", "*", "*")]
EnableCorsAttribute(origins, headers, methods)
It allows the resource to be accessed by all origins,
and it accepts any request header ("accept,content-type,origin...etc"),
and it accepts all methods ("GET,POST...etc")
E.g.
In OnlineGame.WebApi/App_Start/WebApiConfig.cs

```
config.EnableCors();
```

In OnlineGame.WebApi/Controllers/Api/GamerController.cs

```
[EnableCors("*", "*", "*")]
public class GamerController : ApiController
```

http://localhost:49804/Gamer/IndexWebApiJsonp

-->

In Fiddler

19	200	HTTP	localhost:49789	/api/gamer

-->

Headers | TextView | SyntaxView | WebForms | HexView | Auth | Cookies | Raw | JSON | XML

Request Headers [Raw] [Header Definitions]

GET /api/gamer HTTP/1.1

Client

Accept: application/json, text/javascript, */*; q=0.01
Accept-Encoding: gzip, deflate, br
Accept-Language: en-US,en;q=0.9
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/65.0.3325.181

Miscellaneous

Referer: http://localhost:49804/Gamer/IndexWebApiJsonp

Security

Origin: http://localhost:49804

Transport

Connection: keep-alive
Host: localhost:49789

Transformer | Headers | TextView | SyntaxView | ImageView | HexView | WebView | Auth | Caching | Cookies | Raw | JSON | XML

Response Headers [Raw] [Header Definitions]

HTTP/1.1 200 OK

Miscellaneous

Server: Microsoft-IIS/10.0
X-AspNet-Version: 4.0.30319
X-Powered-By: ASP.NET
X-SourceFiles: =?UTF-8?B?RDpcMV9HaXRcS0wwMVwwX0tMXDA4X1dlYkFwaV9LTFxUMDA0XE9ubGluZUdhbWVcT25saW

Security

Access-Control-Allow-Origin: *

3.2.2.2.

//[EnableCors("https://ithandyguytutorial.blogspot.com.au", "*", "*")]

EnableCorsAttribute(origins, headers, methods)

It allows the resource to be accessed by https://ithandyguytutorial.blogspot.com.au origins,
and it accepts any request header ("accept,content-type,origin...etc"),
and it accepts all methods ("GET,POST...etc")

E.g.

In OnlineGame.WebApi/App_Start/WebApiConfig.cs

```
config.EnableCors();
```

In OnlineGame.WebApi/Controllers/Api/GamerController.cs

```
[EnableCors("https://ithandyguytutorial.blogspot.com.au", "*", "*")]
public class GamerController : ApiController
```

http://localhost:49804/Gamer/IndexWebApiJsonp

-->

#	Result	Protocol	Host	URL
8	500	HTTP	localhost:49789	/api/gamer

-->

Headers | TextView | SyntaxView | WebForms | HexView | Auth | Cookies | Raw | JSON | XML

Request Headers [Raw] [Header Definitions]

GET /api/gamer HTTP/1.1

Client

Accept: application/json, text/javascript, */*; q=0.01
Accept-Encoding: gzip, deflate, br
Accept-Language: en-US,en;q=0.9
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/65.0.3325.181

Miscellaneous

Referer: http://localhost:49804/Gamer/IndexWebApiJsonp

Security

Origin: http://localhost:49804

Transport

Connection: keep-alive
Host: localhost:49789

Transformer | Headers | TextView | SyntaxView | ImageView | HexView | WebView | Auth | Caching | Cookies | Raw | JSON | XML

Response Headers [Raw] [Header Definitions]

HTTP/1.1 500 Internal Server Error

Content-Length: 1243
Content-Type: application/json; charset=utf-8

Miscellaneous

Server: Microsoft-IIS/10.0
X-AspNet-Version: 4.0.30319
X-Powered-By: ASP.NET
X-SourceFiles: =?UTF-8?B?RDpcMV9HaXRcS0wwMVwwX0tMXDA4X1dlYkFwaV9LTFxUMDA0XE9ubGluZUdhbWVcT25saW

3.2.2.3.

//[EnableCors("http://localhost:49804", "*", "*")]

It allows the resource to be accessed by http://localhost:49804 origins,
and it accepts any request header ("accept,content-type,origin...etc"),
and it accepts all methods ("GET,POST...etc")

E.g.

In OnlineGame.WebApi/App_Start/WebApiConfig.cs

```
config.EnableCors();
```

In OnlineGame.WebApi/Controllers/Api/GamerController.cs

```
[EnableCors("http://localhost:49804", "*", "*")]
public class GamerController : ApiController
```

http://localhost:49804/Gamer/IndexWebApiJsonp

-->

#	Result	Protocol	Host	URL
2	200	HTTP	localhost:49789	/api/gamer

-->

Headers | TextView | SyntaxView | WebForms | HexView | Auth | Cookies | Raw | JSON | XML

Request Headers [Raw] [Header Definitions]

GET /api/gamer HTTP/1.1

Client

Accept: application/json, text/javascript, */*; q=0.01
Accept-Encoding: gzip, deflate, br
Accept-Language: en-US,en;q=0.9
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/65.0.3325.181

Miscellaneous

Referer: http://localhost:49804/Gamer/IndexWebApiJsonp

Security

Origin: http://localhost:49804

Transport

Connection: keep-alive
Host: localhost:49789

Transformer | Headers | TextView | SyntaxView | ImageView | HexView | WebView | Auth | Caching | Cookies | Raw | JSON | XML

Response Headers [Raw] [Header Definitions]

HTTP/1.1 200 OK

Miscellaneous

Server: Microsoft-IIS/10.0
X-AspNet-Version: 4.0.30319
X-Powered-By: ASP.NET
X-SourceFiles: =?UTF-8?B?RDpcMV9HaXRcS0wwMVwwX0tMXDA4X1dlYkFwaV9LTFxUMDA0XE9ubGluZUdhbWVcT25saW

Security

Access-Control-Allow-Origin: http://localhost:49804