Session 7

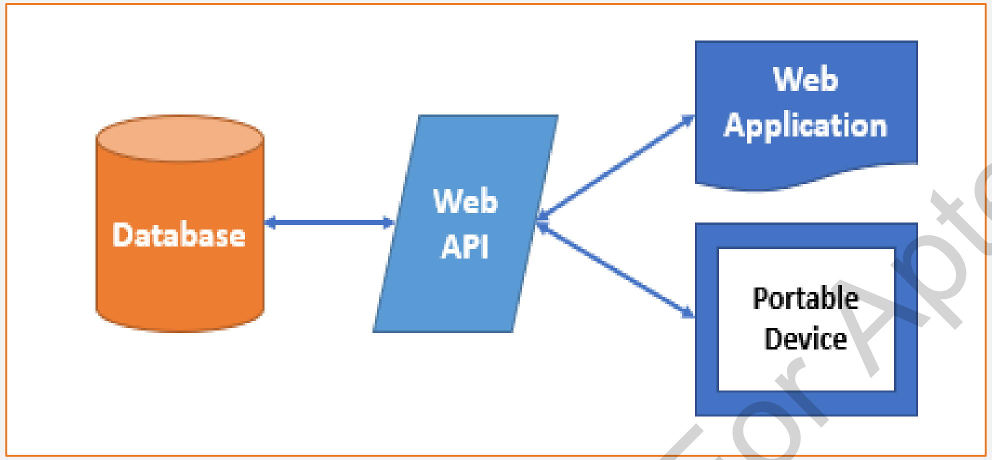
Web API and Web Security

Session Overview

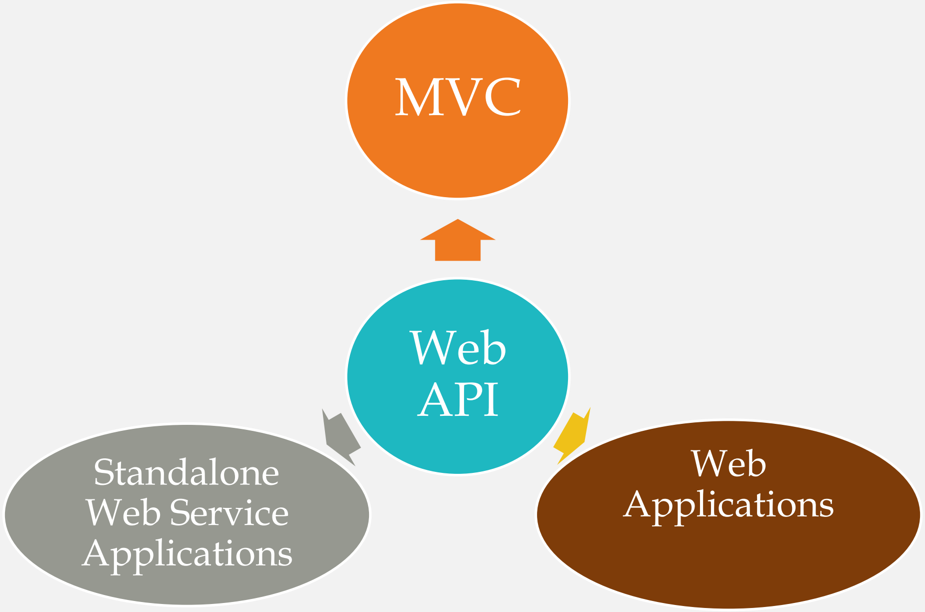
- Define Application Program Interface (API)
- Describe how to create an ASP.NET Web API project
- Describe ASP.NET HTTP client
- Explain how to use Web API with ASP.NET Web forms
- Define Web security

Overview of Web API

- HTTP services can be built using the ASP.NET Web API framework.
- Browsers, mobiles, tablets, and various other clients use these HTTP services.



Web API Framework



Feature of Web API (1-2)

Supports convention based CRUD Actions

Includes accept header and HTTP status code to responses

Does formatting of responses into JSON, XML, or any format by MediaTypeFormatter

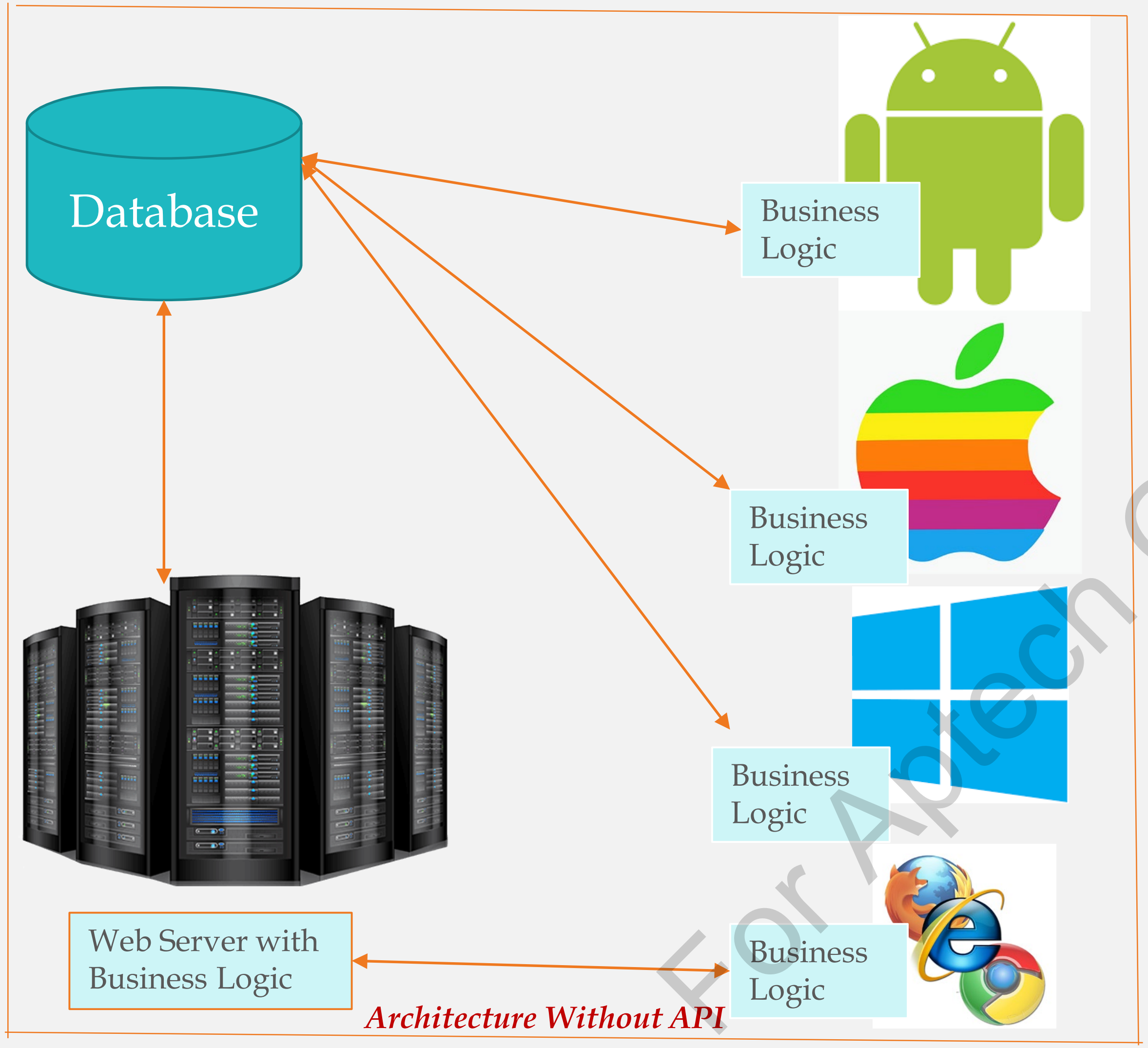
Accepts and generates content, such as images and PDF files

Supports Open Data Protocol (OData) automatically

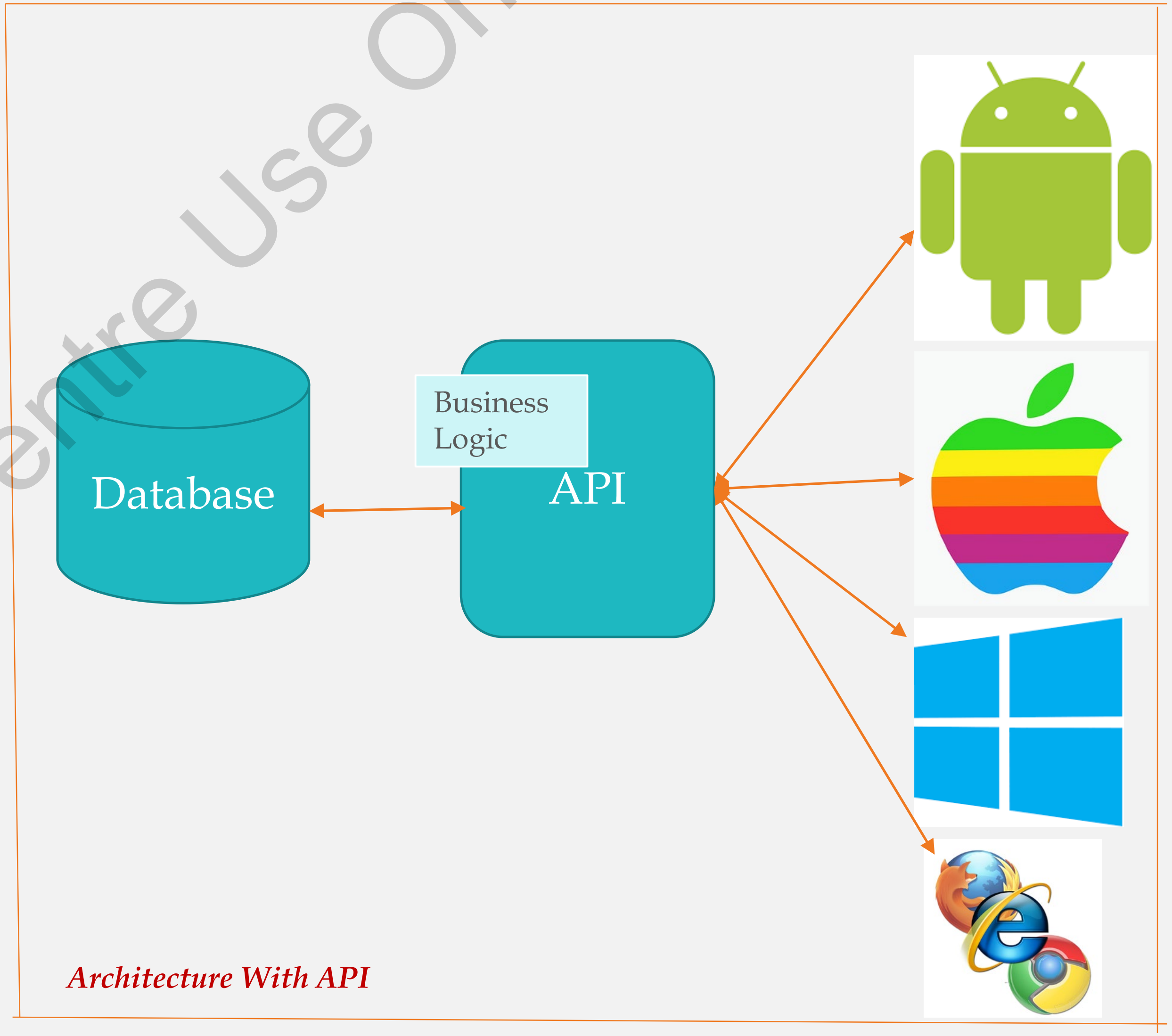
Hosts within application or on IIS

Simple and robust using routing, controllers, action results, and filter

Feature of Web API (2-2)



Architecture Without API

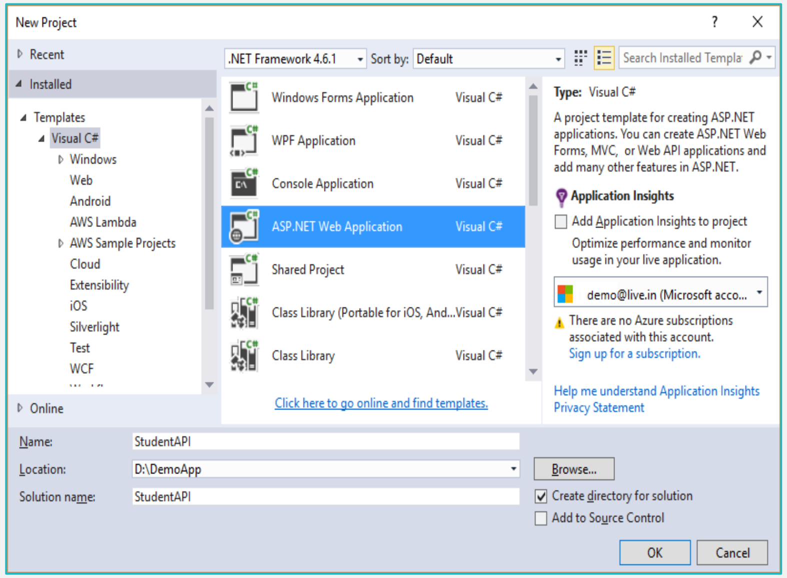


Architecture With API

Reasons For Choosing Web API

- Used for building simple, non-SOAP-based HTTP services on existing WCF message pipeline.
- No need of tedious configuration, such as WCF REST service.
- Used when requiring a simple service creation with Web API.
- Based only on HTTP and is simple to describe, show, and utilize in a RESTful manner.
- Useful for devices that have limited bandwidth such as smartphones.
- Based on a light weight architecture and is open source.

Creating a Web API Project



Windows Forms Application	Visual C#
WPF Application	Visual C#
Console Application	Visual C#
ASP.NET Web Application	Visual C#
Shared Project	Visual C#
Class Library (Portable for iOS, And...	Visual C#
Class Library	Visual C#

Click here to go online and find templates.

Type: Visual C#

A project template for creating ASP.NET applications. You can create ASP.NET Web Forms, MVC, or Web API applications and add many other features in ASP.NET.

Application Insights

□ Add Application Insights to project

Optimize performance and monitor usage in your live application.

demo@live.in (Microsoft acco...

There are no Azure subscriptions associated with this account.
Sign up for a subscription.

Help me understand Application Insights
Privacy Statement

Name: StudentAPI

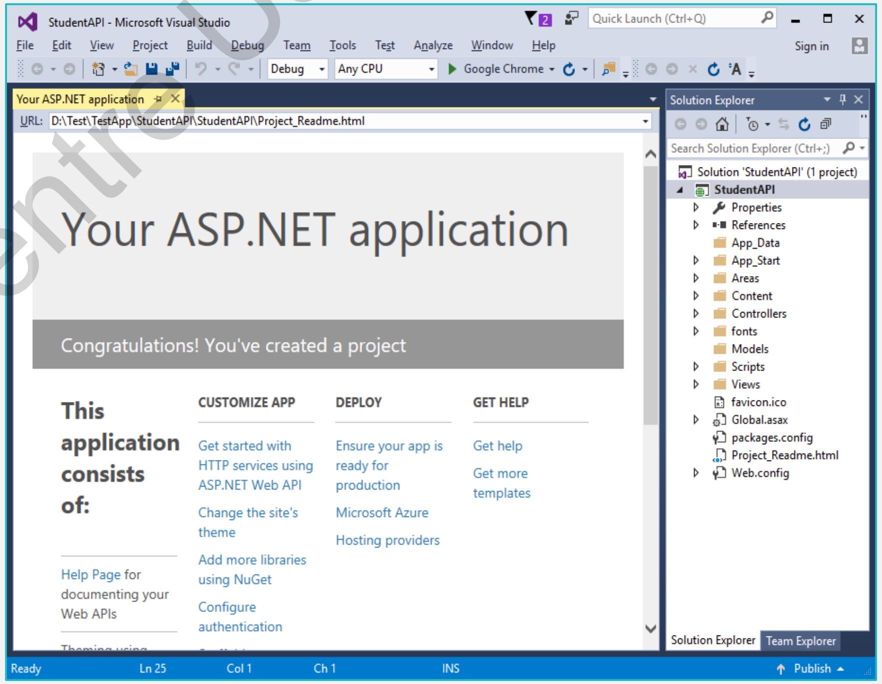
Location: D:\DemoApp

Solution name: StudentAPI

☑ Create directory for solution

□ Add to Source Control

New Project Window



URL: D:\Test\TestApp\StudentAPI\StudentAPI\Project_Readme.html

Your ASP.NET application

Congratulations! You've created a project

This application consists of:

Help Page for documenting your Web APIs

CUSTOMIZE APP

Get started with HTTP services using ASP.NET Web API

Change the site's theme

Add more libraries using NuGet

Configure authentication

DEPLOY

Ensure your app is ready for production

Microsoft Azure

Hosting providers

GET HELP

Get help

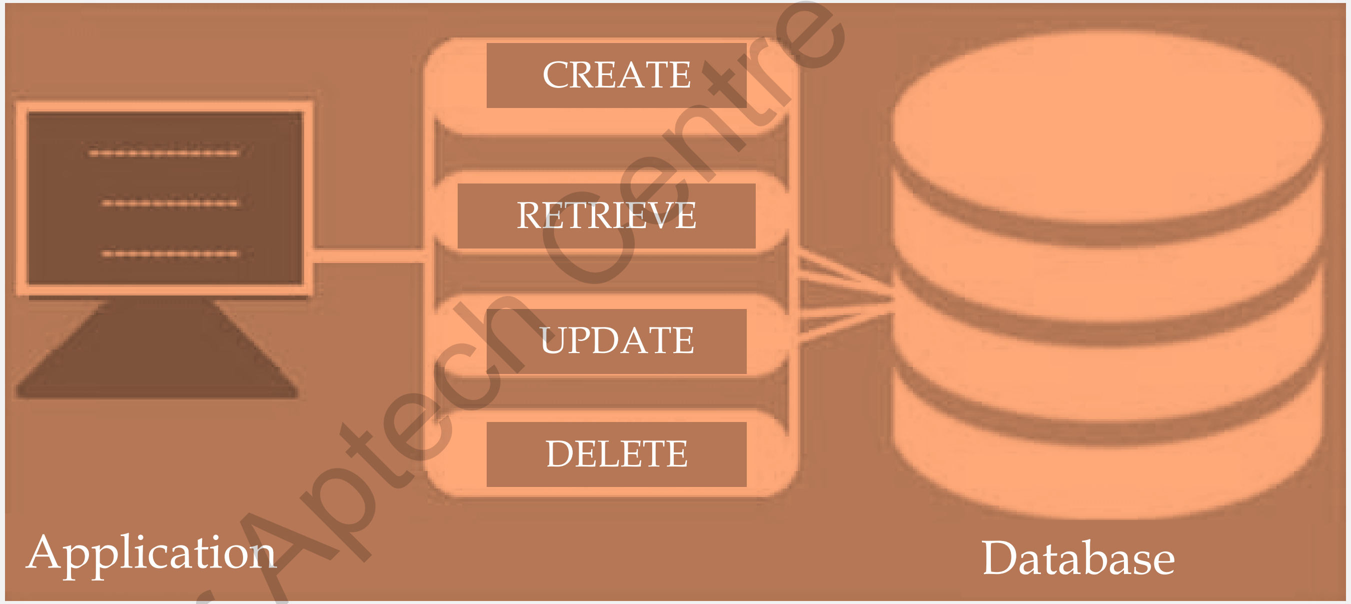
Get more templates

```
Solution 'StudentAPI' (1 project)
  StudentAPI
    Properties
    References
    App_Data
    App_Start
    Areas
    Content
    Controllers
    fonts
    Models
    Scripts
    Views
    favicon.ico
    Global.asax
    packages.config
    Project_Readme.html
    Web.config
```

New Project

Creating a Web API that Supports CRUD Operations

One of the features of Web API is that it supports convention-based CRUD actions.

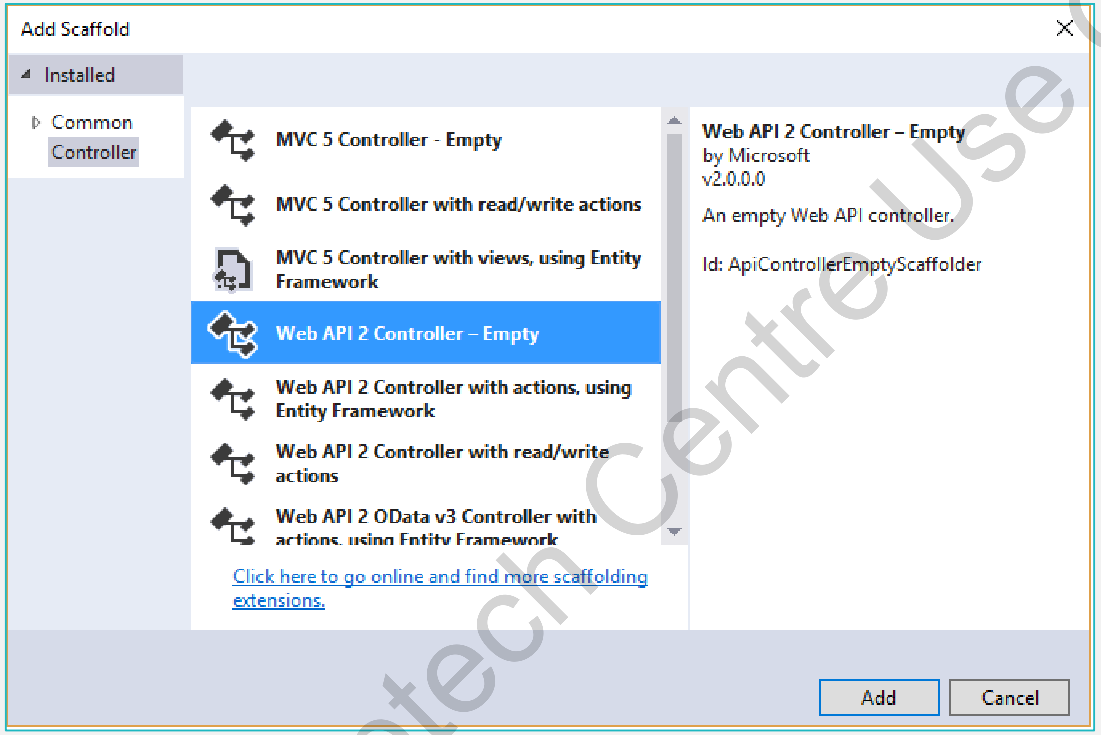


Web API with Repository Pattern (1-3)

Repository pattern:

- Isolates business objects from the data access layer and creates an abstract layer.
- Reduces amount of code for automated unit testing and maximizes isolated data access from the data store.
- Helps data access, code readability, and maintainability to be centralized and hence includes a flexible architecture.

Web API with Repository Pattern (2-3)



Add Scaffold

Installed
Common
Controller
MVC 5 Controller - Empty
MVC 5 Controller with read/write actions
MVC 5 Controller with views, using Entity Framework
Web API 2 Controller – Empty
Web API 2 Controller with actions, using Entity Framework
Web API 2 Controller with read/write actions
Web API 2 OData v3 Controller with actions, using Entity Framework
Click here to go online and find more scaffolding extensions.
Add
Cancel

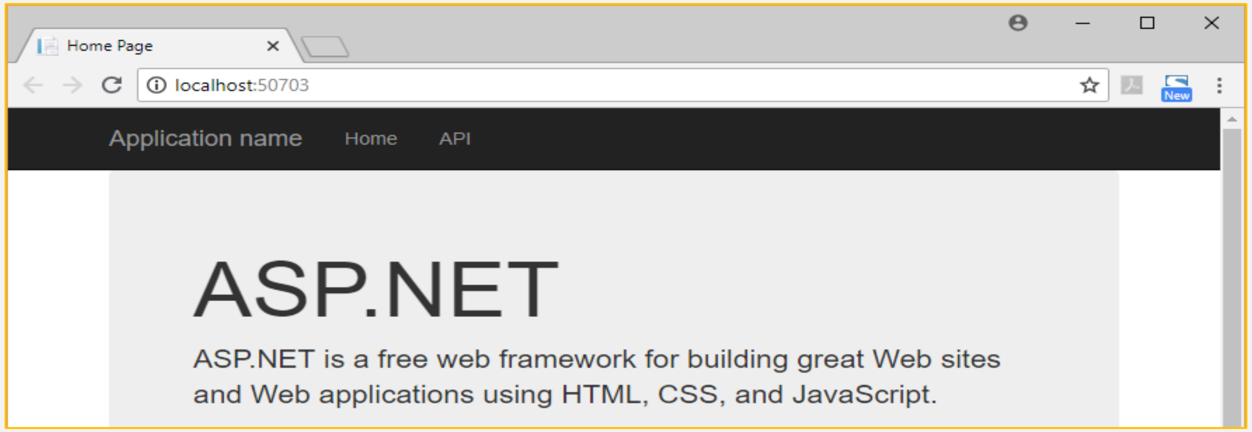
Web API 2 Controller – Empty
by Microsoft
v2.0.0.0

An empty Web API controller.

Id: ApiControllerEmptyScaffolder

Web API 2 Controller - Empty

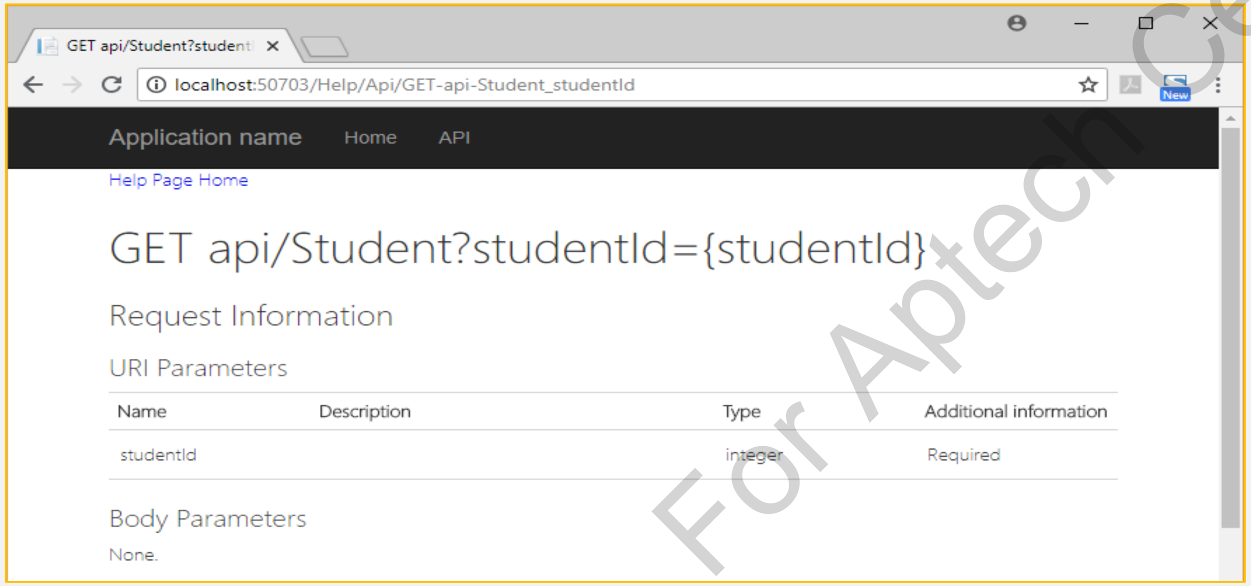
Web API with Repository Pattern (3-3)



ASP.NET

ASP.NET is a free web framework for building great Web sites and Web applications using HTML, CSS, and JavaScript.

Web API Run Page



GET api/Student?studentId={studentId}

Request Information

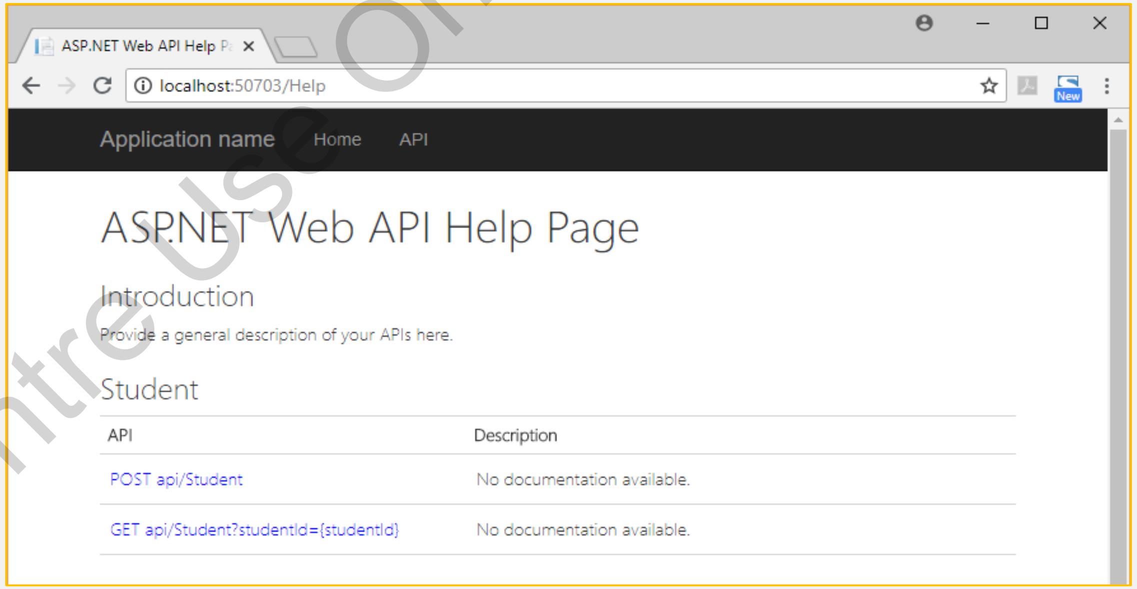
URI Parameters

Name	Description	Type	Additional information
studentId		integer	Required

Body Parameters

None.

Web API Details



ASP.NET Web API Help Page

Introduction

Provide a general description of your APIs here.

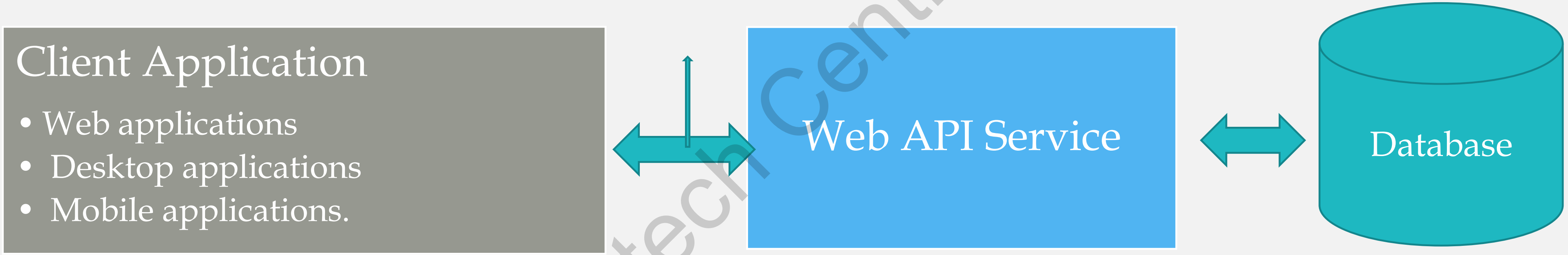
Student

API	Description
POST api/Student	No documentation available.
GET api/Student?studentId={studentId}	No documentation available.

List of Web APIs

ASP.NET Web API and HTTP Client Samples

HttpClient performing an asynchronous call to the Web API



Methods of the HttpClient Class

Method	Description
GetAsync	GET request is sent to a specified URI
PostAsync	POST request is sent to a specified URI
PutAsync	PUT request is sent to a specified URI
DeleteAsync	DELETE request is sent to a specified URI

Methods of the HttpClient Class

Following is the inheritance hierarchy:

```
System.Object
System.Net.Http.HttpMessageInvoker
System.Net.Http.HttpClient
```

Namespace: System.Net.Http

Assembly: System.Net.Http (in System.Net.Http.dll)

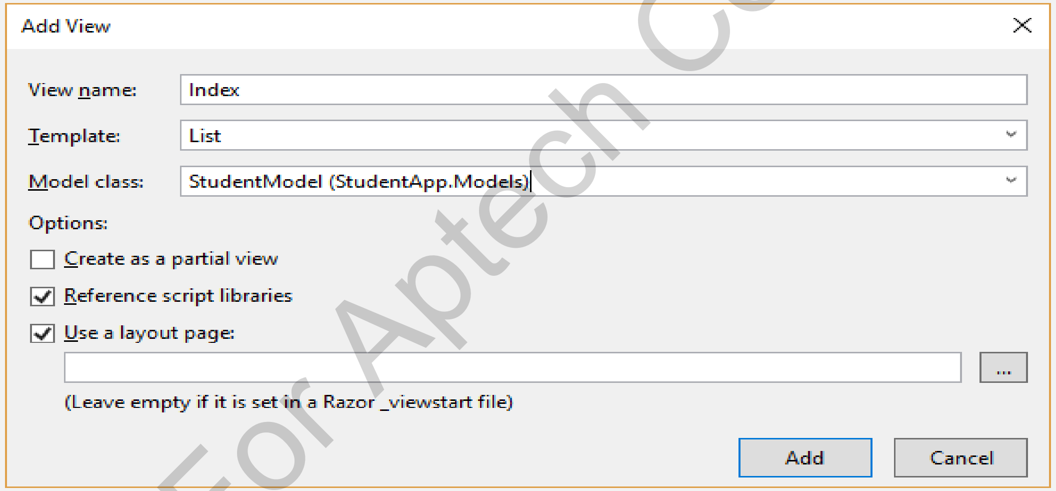
Methods of the Student ApiController

Method	HTTP Verb	Description
Get()	GET	All records are returned as IEnumerable
Get(int)	GET	A specific record object matching the specified parameter is returned
Post(Student)	POST	A new recorder is inserted into the database
Put(int, Student)	PUT	An existing record from the database based on a specific ID is updated
Delete(int)	DELETE	An existing record from the database based on a specific ID is deleted

Methods of the Student ApiController

Using Web API with ASP.NET MVC Application

1. Create a new MVC Web application
2. Add model to the application
3. Add controller to the application
4. Add routing information to `Global.asax`
5. Make a client call



Add View

View name: Index

Template: List

Model class: StudentModel (StudentApp.Models)

Options:

☐ Create as a partial view

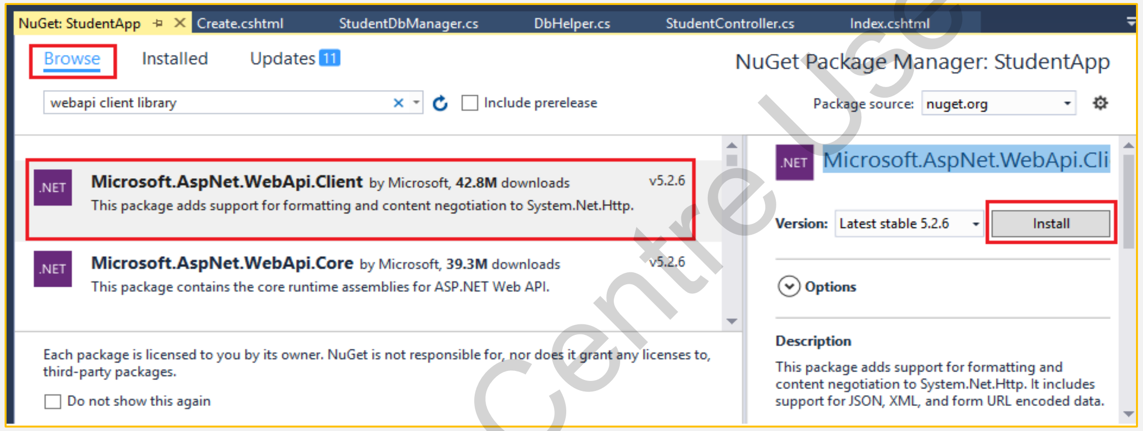
☑ Reference script libraries

☑ Use a layout page:

(Leave empty if it is set in a Razor _viewstart file)

MVC View Scaffolding

Calling Web API from the MVC Application (1-2)



webapi client library

□ Include prerelease

Package source: nuget.org

Microsoft.AspNet.WebApi.Client by Microsoft, **42.8M** downloads v5.2.6
This package adds support for formatting and content negotiation to System.Net.Http.

Microsoft.AspNet.WebApi.Core by Microsoft, **39.3M** downloads v5.2.6
This package contains the core runtime assemblies for ASP.NET Web API.

Each package is licensed to you by its owner. NuGet is not responsible for, nor does it grant any licenses to, third-party packages.

□ Do not show this again

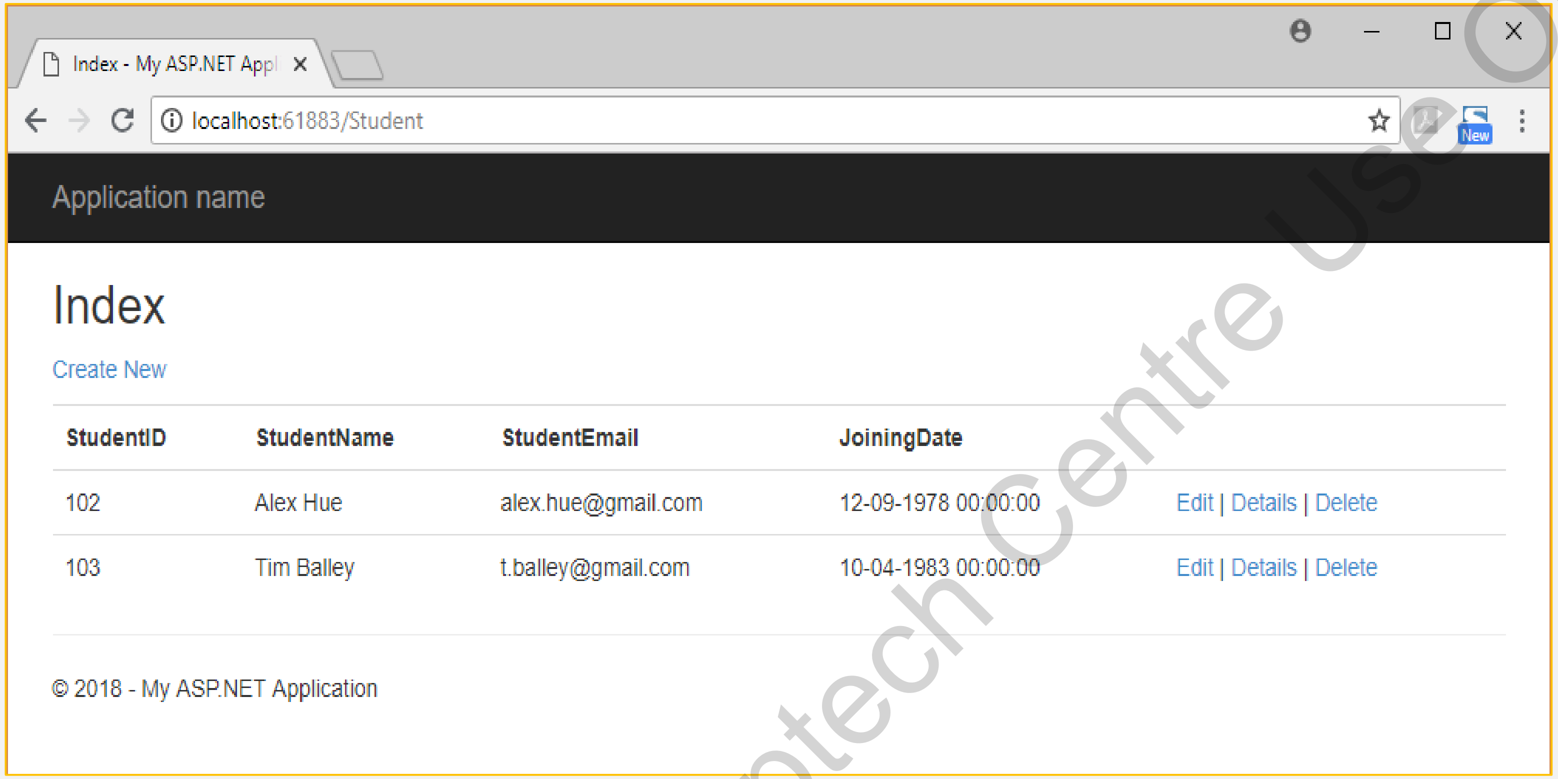
Microsoft.AspNet.WebApi.Cli

Version: Latest stable 5.2.6

Description

This package adds support for formatting and content negotiation to System.Net.Http. It includes support for JSON, XML, and form URL encoded data.

Calling Web API from the MVC Application (2-2)



Index

Create New

StudentID	StudentName	StudentEmail	JoiningDate	
102	Alex Hue	alex.hue@gmail.com	12-09-1978 00:00:00	Edit | Details | Delete
103	Tim Balley	t.balley@gmail.com	10-04-1983 00:00:00	Edit | Details | Delete

© 2018 - My ASP.NET Application

MVC Web Application Running with WebAPI

Introduction to Web Security, Authentication, and Authorization

Determining the identity of the user is called **Authentication**.

Deciding if the user can or cannot perform an action is called **Authorization**.

Summary

- MVC is a framework that helps developers to create Web applications in which sections of code are organized by the functions they perform.
- Fundamental pattern component of an MVC application is the component called the view. It is accountable for rendering the user interface, irrespective of it being an HTML or a UI widget on a desktop application.
- HTTP services are built using the ASP.NET Web API framework.
- When the Web API framework receives an HTTP request, the action to be invoked is determined by the routing table.
- HTTP requests/responses from a URL are sent/received using a base class that `HttpClient` provides.
- .NET applications use the `HttpClient` component as an HTTP client.
- ASP.NET Web API helps to program HTTP verbs, such as `GET, POST, PUT`, and `DELETE`.
- It is possible to implement Web API with Web forms.
- Determining the identity of a user is called authentication. Deciding whether a user is allowed to perform an action is called authorization.