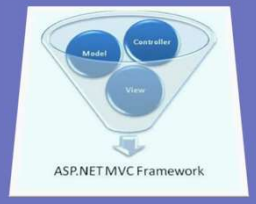

Microsoft ASP.net MVC

Introduction to ASP.NET MVC

The HTTP Protocol

How HTTP Works?

Table of Contents

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HTTP

- Hyper Text Transfer Protocol (HTTP)
  - Client-server protocol for transferring Web resources (HTML files, images, styles, etc.)
- Important properties of HTTP
  - Request-response model
  - Text-based format
  - Relies on a unique resource URLs
  - Provides resource metadata (e.g. encoding)
  - Stateless (cookies can overcome this)

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HTTP: Request-Response Protocol

- Client program
  - Running on end host
  - E.g. Web browser
  - Requests a resource
- Server program
  - Running at the server
  - E.g. Web server
  - Provides resources

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HTTP Request Message

- Request message sent by a client consists of
  - Request line – request method (GET, POST, HEAD, ...), resource URI, and protocol version
  - Request headers – additional parameters
  - Body – optional data

Request Header	Value
(Request-Line)	GET / HTTP/1.1
Host	www.stdio.vn
User-Agent	Mozilla/5.0 (Windows NT 6.3; WOW64; rv:36.0) Gecko/20100101 Firefox/36.0
Accept	text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language	vi-VN,vi;q=0.8,en-US;q=0.5,en;q=0.3
Accept-Encoding	gzip, deflate
Cookie	_ga=GA1.2.529740874.1426574792; PHPSESSID=0e61i2eb0mff46hejl7r0kfms2; _gat=1; ci_session=a%3...
Connection	keep-alive

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HTTP Response Message

- Response message sent by the server
  - Status line – protocol version, status code, status phrase
  - Response headers – provide meta data
  - Body – the contents of the response (the

Response Header	Value
(Status-Line)	HTTP/1.1 304 Not Modified
Date	Tue, 17 Mar 2015 14:15:52 GMT
Server	Apache/2
Connection	Keep-Alive
Keep-Alive	timeout=1, max=100
Etag	"b8c1a-2275-5115f173d1e40"
Vary	Accept-Encoding,User-Agent

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HTTP Response Codes

- HTTP response code classes
  - 1xx: informational (e.g., "100 Continue")
  - 2xx: success (e.g., "200 OK")
  - 3xx: redirection (e.g., "304 Not Modified", "302 Found")
  - 4xx: client error (e.g., "404 Not Found")
  - 5xx: server error (e.g., "503 Service Unavailable")
- "302 Found" is used for redirecting the Web browser to another URL

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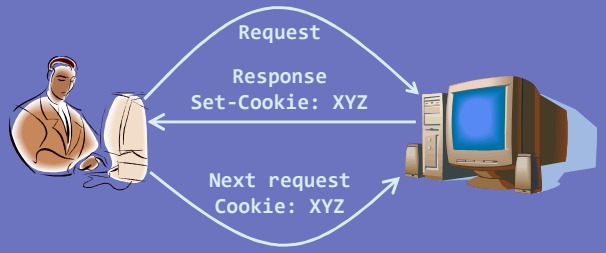
HTTP Cookies

- Cookie
  - Cookies are small pieces of data stored by the client on behalf of the server
  - Included in all future HTTP requests to the server



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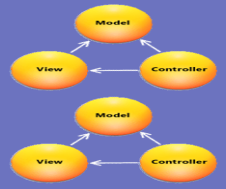
The MVC Pattern

- Model–view–controller (MVC) is a software architecture pattern
- Originally formulated in the late 1970s by Trygve Reenskaug as part of the Smalltalk
- Code reusability and separation of concerns
- Originally developed for desktop, then adapted for internet applications



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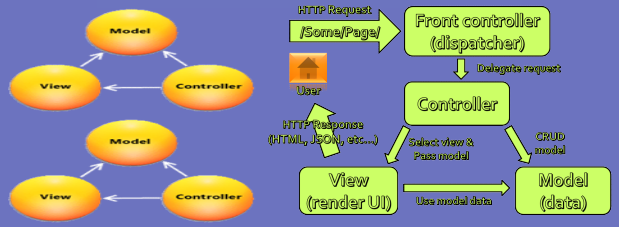
The MVC Pattern



Model

- Set of classes that describes the data we are working with as well as the business
- Rules for how the data can be changed and manipulated
- May contain data validation rules
- Often encapsulate data stored in a database as well as code used to manipulate the data
- Most likely a Data Access Layer of some kind
- Apart from giving the data objects, it doesn't have significance in the framework

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View

- Defines how the application's user interface (UI) will be displayed
- May support master views (layouts) and sub-views (partial views or controls)
- Web: Template to dynamically generate HTML

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MVC Steps

- Incoming request routed to Controller
  - For web: HTTP request
- Controller processes request and creates presentation Model
  - Controller also selects appropriate result (view)
- Model is passed to View
- View transforms Model into appropriate output format (HTML)
- Response is rendered (HTTP Response)

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Controller

- The core MVC component
- Process the requests with the help of views and models
- A set of classes that handles
  - Communication from the user
  - Overall application flow
  - Application-specific logic

- Every controller has one or more "Actions"

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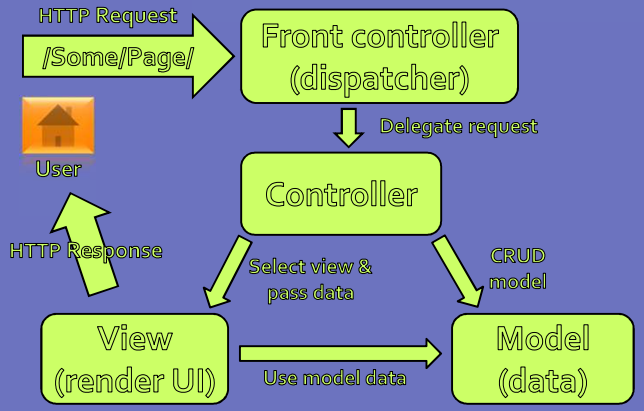
The MVC Pattern for Web



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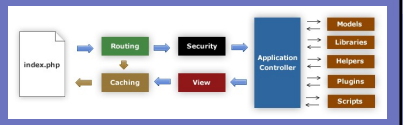
MVC Frameworks

- CakePHP (PHP)
- CodeIgniter (PHP)
- Spring (Java)
- Perl: Catalyst, Dancer
- Python: Django, Flask, Grok
- Ruby: Ruby on Rails, Camping, Nitro, Sinatra
- JavaScript: AngularJS, JavaScriptMVC, Spine
- ASP.NET MVC (.NET Framework)



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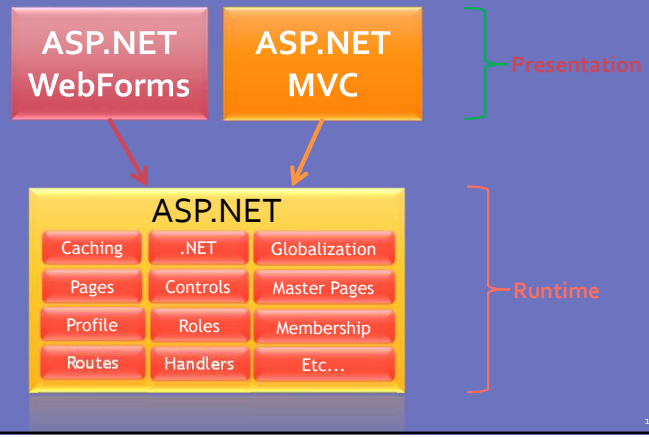
ASP.NET Core



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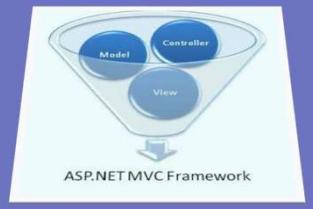
Microsoft ASP.net MVC

ASP.NET MVC



ASP.NET Web Forms

- Stable and mature, supported by heaps of third party controls and tools
- Event driven web development
- Postbacks
- Viewstate
- Less control over the HTML
- Hard to test
- Rapid development

ASP.NET

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ASP.NET History

- Classic ASP introduced in late 1990's
- ASP.NET 1.0 – 2002 (Web Forms)
- ASP.NET 3.5 – 2008 (First version of MVC)
  - Two more versions in next two years
- ASP.NET 4 – 2010 (VS 2010, MVC 2.0, Razor)
- ASP.NET 4.5 (First version of Web API, VS 2012)
- February 2013 – SignalR
- Autumn 2013 – VS 2013, One ASP.NET, MVC 5
- November 2014 – VS 2015, One ASP.NET, MVC 6
- ASP.NET vNext – 2016, ?

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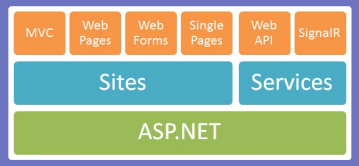
One ASP.NET

- Web Forms
  - Component-based
- ASP.NET MVC
- Web Pages
  - Lightweight framework for dynamic content
- Web API
  - Framework for building RESTful Web services
- SignalR
  - Real-time client-server communication



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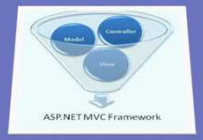
ASP.NET MVC

- Runs on top of ASP.NET
  - Not a replacement for WebForms
  - Leverage the benefits of ASP.NET
- Embrace the web
  - User/SEO friendly URLs, HTML 5, SPA
  - Adopt REST concepts
- Uses MVC pattern
  - Conventions and Guidance
  - Separation of concerns



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ASP.NET MVC (2)

- Tight control over markup
- Testable
- Loosely coupled and extensible
- Convention over configuration
- Razor view engine
  - One of the greatest view engines
  - With intellisense, integrated in Visual Studio
- Reuse of current skills (C#, EF, LINQ, JS, etc.)
- Application-based (not scripts like PHP)

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The ASP.NET MVC History

- ASP.NET MVC 1.0
  - In February 2007, Scott Guthrie ("ScottGu") of Microsoft sketched out the core of ASP.NET MVC
  - Released on 13 March 2009
- ASP.NET MVC 2.0 (Areas, Async)
  - Released just one year later, on 10 March 2010
- ASP.NET MVC 3.0 (Razor) – 13 January 2011
- ASP.NET MVC 4.0 (Web API) – 15 August 2012
- ASP.NET MVC 5.0 (Identity) – 17 October 2013
- ASP.NET MVC 6.0 – 6 November 2014

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Separation of Concerns

- Each component has one responsibility
  - SRP – Single Responsibility Principle
  - DRY – Don't Repeat Yourself
- More easily testable
  - TDD – Test-driven development
- Helps with concurrent development
  - Performing tasks concurrently
    - One developer works on views
    - Another works on controllers

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Extensible

- Replace any component of the system
  - Interface-based architecture
- Almost anything can be replaced or extended
  - Model binders (request data to CLR objects)
  - Action/result filters (e.g. OnActionExecuting)
  - Custom action result types
  - View engine (Razor, WebForms, NHaml, Spark)
  - View helpers (HTML, AJAX, URL, etc.)
  - Custom data providers (ADO.NET), etc.

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Clean URLs

- REST-like
  - /products/update
  - /blog/posts/2013/01/28/mvc-is-cool
- Friendlier to humans
  - /product.aspx?catId=123 or post.php?id=123
  - Becomes /products/chocolate/
- Friendlier to web crawlers
  - Search engine optimization (SEO)

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Community-based

- ASP.NET MVC, Web API, and Web Pages source code is available in CodePlex
  - http://aspnetwebstack.codeplex.com/
- You can vote for new features in ASP.NET UserVoice site
  - http://aspnet.uservoice.com/forums/41199-general-asp-net

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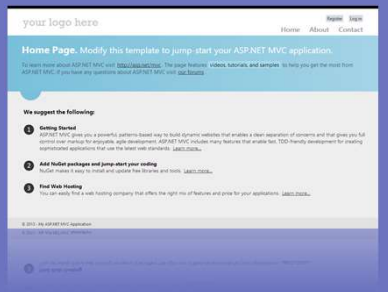
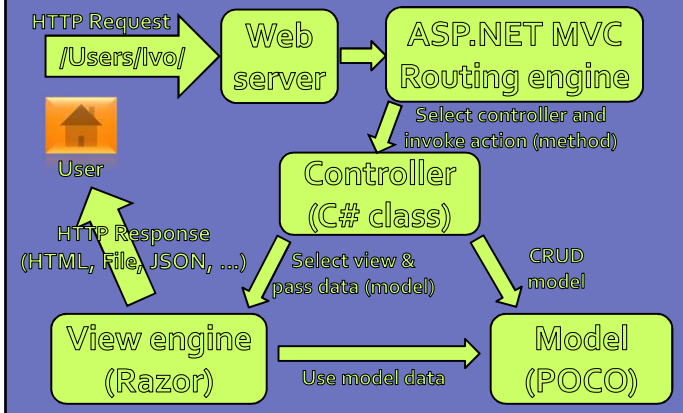
Creating ASP.NET MVC Project



MVC Pattern in ASP.NET MVC



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The Tools

- Tools that we need:
  - IDE: Visual Studio 2013 (2012 is also OK)
  - Framework: .NET Framework 4.5
  - Web server: IIS 8.5 (Express)
  - Data: Microsoft SQL Sever (Express or LocalDB)
- Visual Studio installer will install everything we need
  - http://www.microsoft.com/visualstudio/eng/2013-downloads

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The Technologies

- Technologies that ASP.NET MVC uses
  - C# (OOP, unit testing, async, etc.)
  - ASP.NET
  - HTML(5) and CSS
  - JavaScript (jQuery, KendoUI, AngularJS, etc.)
  - AJAX, Single-page apps
  - Databases (MS SQL)
  - ORM (Entity Framework and LINQ)
  - Web and HTTP

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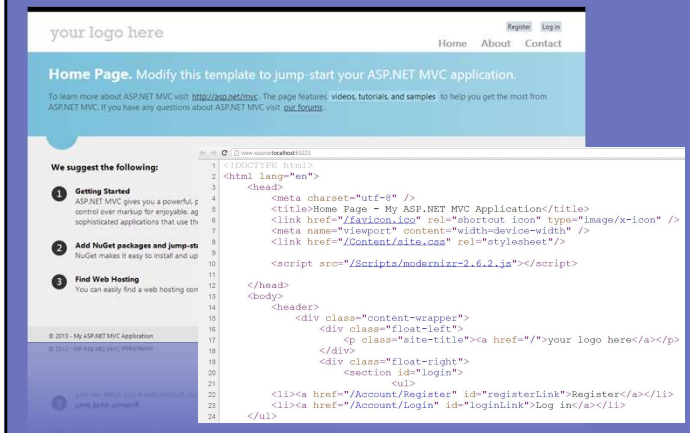
VS 2012: Default Layout



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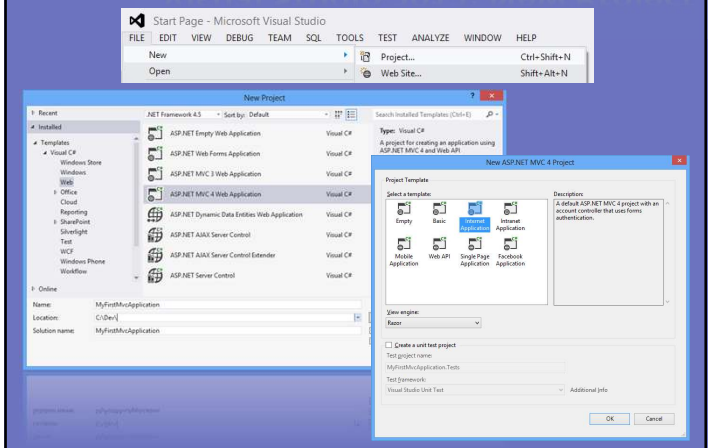
Visual Studio 2012: New Project



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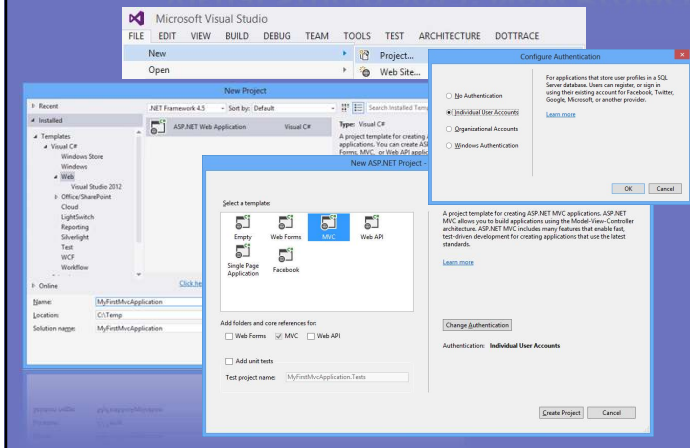
Visual Studio 2013: New Project



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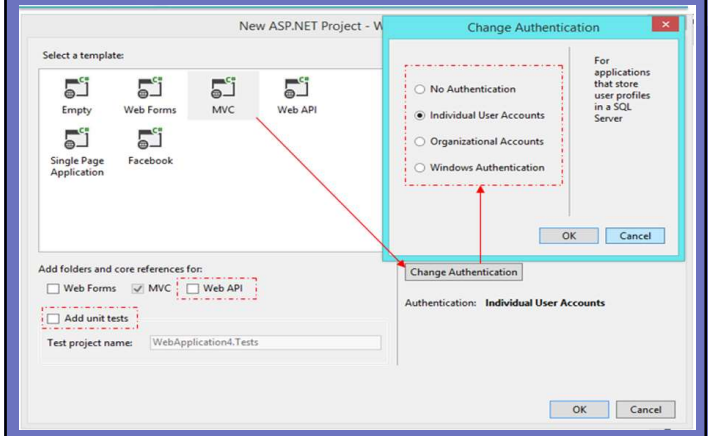
Visual Studio 2013: New Project



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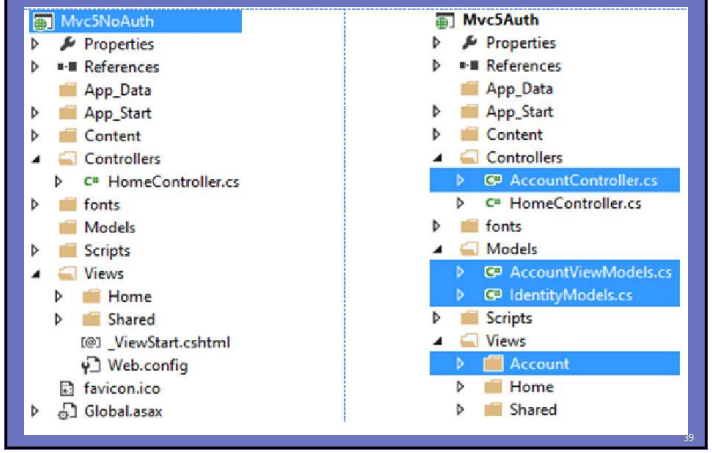
Visual Studio 2013: New Project



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Visual Studio 2013: New Project

- **Individual User Accounts**: The project was created the kind of projects including the security Internet
- **No Authentication**: The project was created as the project does not include the security Internet.
- **Windows Authentication**: The project was created the kind of project the Intranet including the security, but the account is managed on the intranet.
- **Organizational Accounts**: The project was created the kind of projects using accounts from cloud computing.

You can choose to add Web API support library building web

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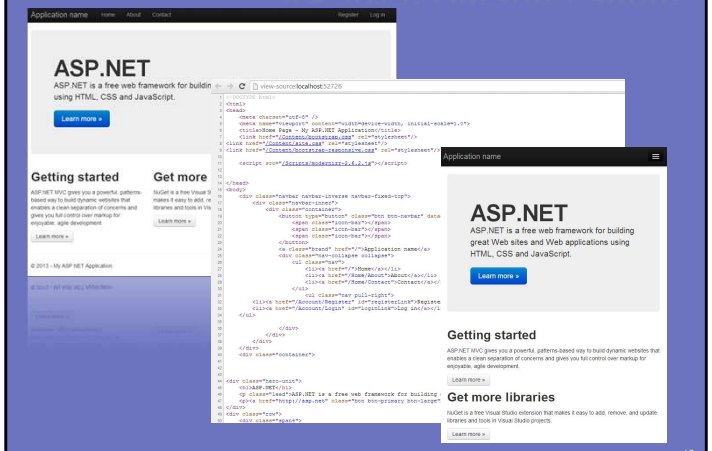
VS 2013: Default Layout



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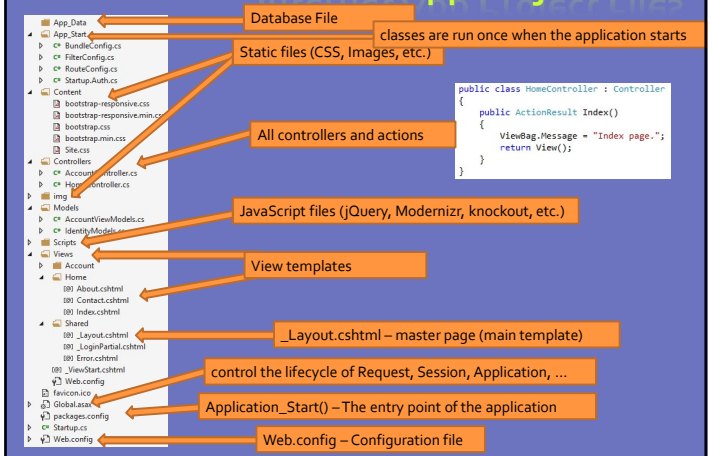
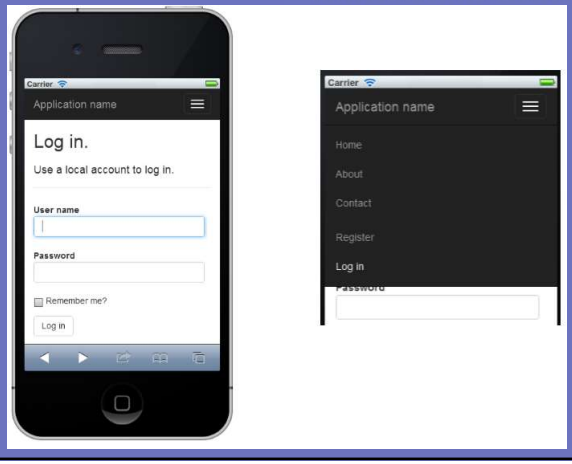
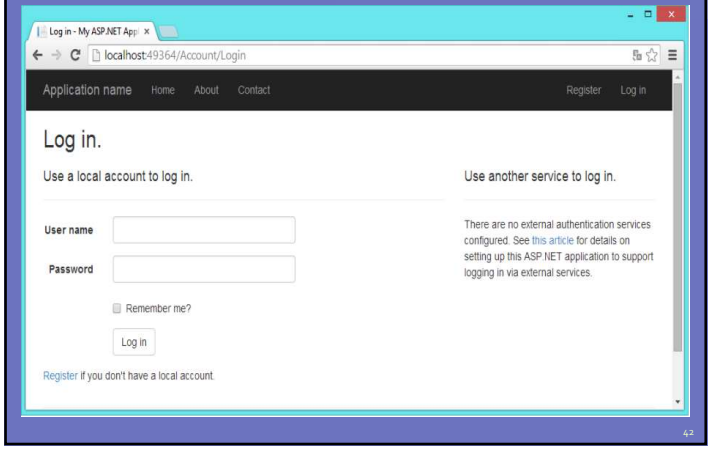
Internet App Project Files



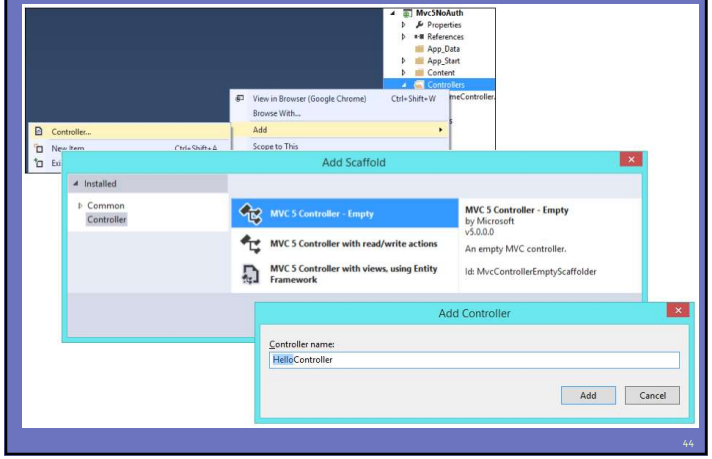
Website in mobile



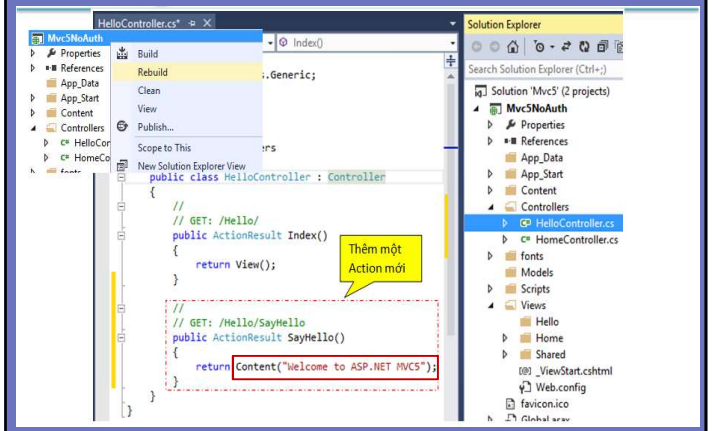
Website in desktop



Create controller



Create controller



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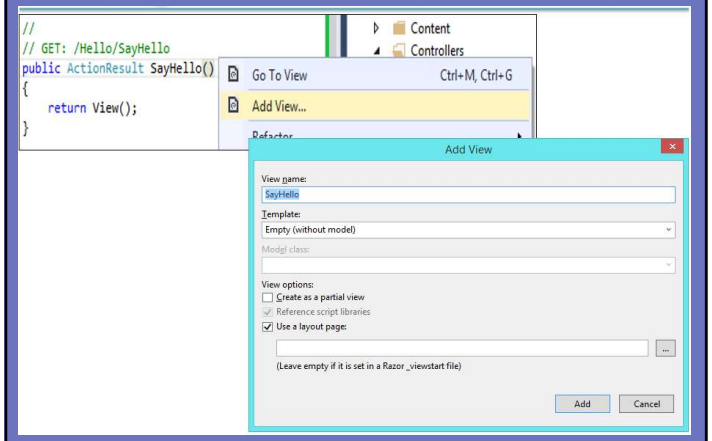
Create view for action



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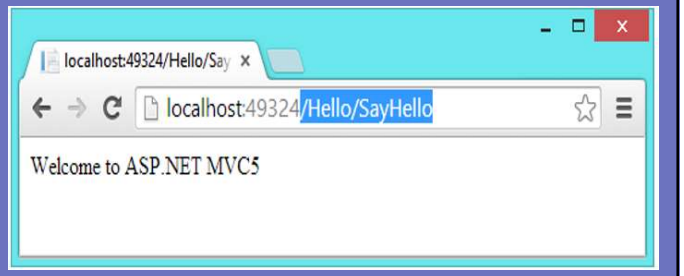
Create controller



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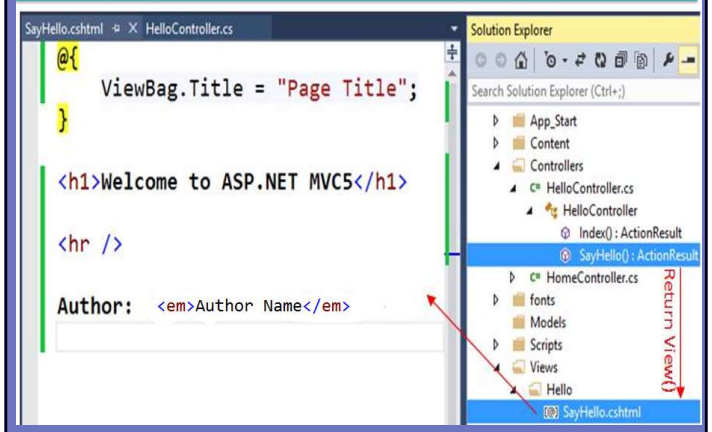
Razor code in view



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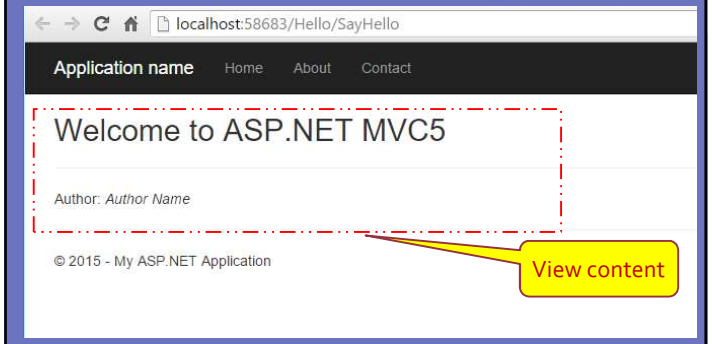
Display in browser



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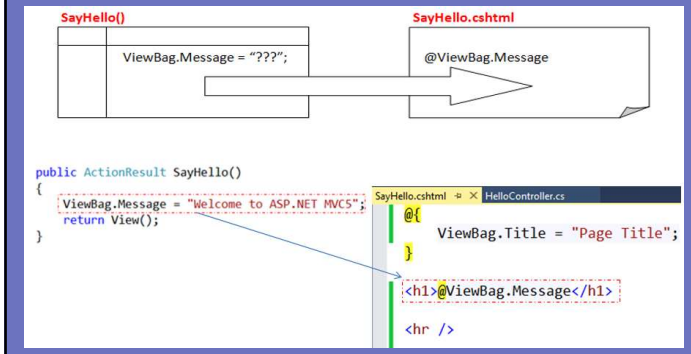
NuGet Package Management

Passing data from Controller to View

- Simple:



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NuGet package management

- Free, open source package management
- Makes it easy to install and update open source libraries and tools
- Part of Visual Studio 2012/2013
- Configurable package sources
- Simple as adding a reference
- GUI-based package installer
- Package manager console

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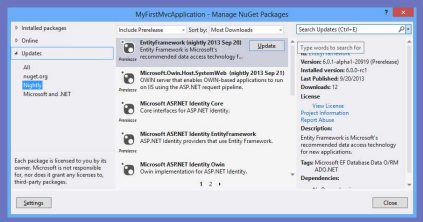
Nightly Builds

- Nightly builds of ASP.NET MVC are available via a private NuGet feed
  - In your Package Manager settings add the following package source:

http://www.myget.org/F/aspnetwebstacknightly/



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Summary

- HTTP is a client-server protocol for transferring web resources via Internet
- Model–view–controller (MVC) is a software architecture pattern
- ASP.NET MVC is a great platform for developing Internet applications
- Visual Studio is the main development tool for creating ASP.NET MVC applications
  - Almost everything in ASP.NET MVC is a package
- Glimpse is a tool that helps with debugging

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Demo: NuGet

Install and update packages as easy as adding a reference

Introduction to ASP.NET MVC