What You, as an ASP.NET Developer, Need to Know About jQuery

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What we'll be looking at...

- Why jQuery?
- jQuery fundamentals
- Creating and manipulating elements
- Events
- Animations and effects
- Talking to the server
- jQuery UI
- Writing plugins
- Breaking news around new releases
- Using the CDN

ter these topics,
You'll say...

Throughout the session...

- You’ll see some

- Goal: show a particular place where jQuery really stands out

Hi, jQuery

- jQuery is
  - Most popular, cross-browser JavaScript library
  - Focusing on making client-side scripting of HTML simpler
    - Easy navigating the DOM
    - Handling events
    - Working with Ajax
  - Open-source, released in 2006

Why jQuery?

- Many JavaScript frameworks try bending the language out of its natural form
- jQuery aims at leveraging CSS, HTML and JavaScript
- Advantages
  - Lightweight
  - Easy to learn using familiar CSS syntax and intuitive
  - Many plugins available
  - Easy to extend and compatible
  - It’s on Microsoft’s radar
  - Rich community

You can read this, right?

```
$('#something').hide().css('background',
'red').fadeIn();
```

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You are not alone!

- Many LARGE companies use jQuery for their sites, including:

More at http://docs.jquery.com/Sites_Using_jQuery

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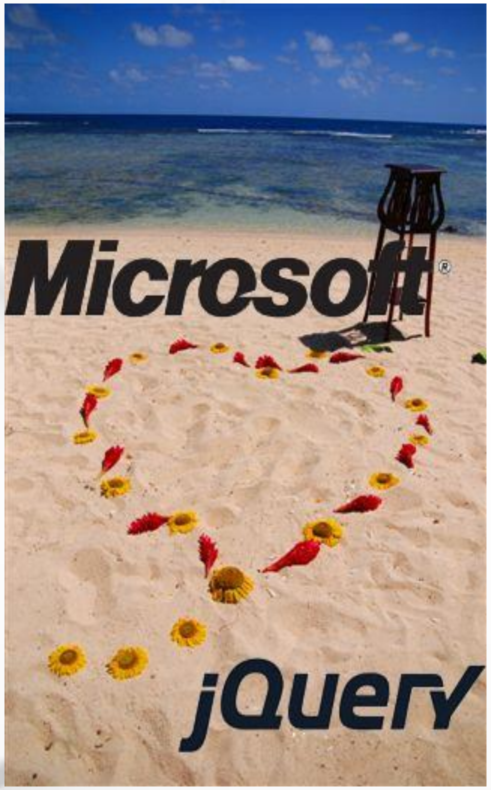
Microsoft and jQuery

- Included with Visual Studio in both WebForms and MVC projects
  - Can be used with or without ScriptManager
  - ScriptManager can be used to compress and combine scripts
  - IntelliSense available
  - CDN support (more later)
- Microsoft is contributor to jQuery
  - Proposed (and accepted) templating, data linking and globalization



Script, don’t get in my way!

- jQuery helps us writing *Unobstrutive JavaScript* code
- You don’t want to mingle style with HTML
- Why would you want to mingle *behavior* with HTML?

This code is downloaded every

```
<script type="text/javascript">
  window.onload = function() {
    document.getElementById('testButton').onclick = functio
      document.getElementById('xyz').style.color = 'red';
    };
  };
</script>
```

- This will become a heavy job without jQuery!

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jQuery fundamentals: $

- $ function (aka jQuery() function) returns
  - A JavaScript object containing an array of DOM elements
  - In the order they were found in the document
  - Matching a specified selector (for example a CSS selector)
  - Known to mankind as a wrapper or wrapped set

```
$("div.someClass").show();
```

Finds all D
Class some
Sets them v

- It returns the same group of elements, can be chained

```
$("div.someClass").show().addClass("SomeOtherClass");
```

To the same set, this
adds another class

jQuery fundamentals: the ready handler

- Script execution should wait until DOM elements are ready
  - You say: window.onload?
  - Sadly, this waits for everything to be loaded, including images etc
  - Script execution is *too late*
- Instead, we need to wait only until the DOM tree is created
  - Can be difficult in cross-browser situations
  - Easy-peasy with jQuery

I ♥ jQuery

```
$(document).ready(function(
) {

$("div.someClass").show();
});
```

```
$(function() {

$("div.someClass").sho
w();
});
```

jQuery fundamentals: selectors

- At the core of jQuery lies its selector engine
  - Can be used to select elements based on names, attribute, position...
- $() is heavily overloaded
  - Making a selection
  - Creating new HTML elements

jQuery fundamentals: selectors

- Most basic: CSS selectors

```
$("p a.someClass")
```

Selects all a's with someClass applied within a paragraph

  – Can be combined

```
$("p a.someClass, div")
```

Also includes all DIVs on the page

- Child selector

```
$("ul.someList > li > a")
```

Selects all links, directly in an LI, within an UL with someList class

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jQuery fundamentals: selectors

- Attribute selector

```
$("a[href*='http://www.snowball.be']")
```

Selects all links that contain a reference to my site

```
$("span[class^='some']")
```

Select all SPANs whose class attribute starts with some

```
$("span[class]")
```

Select all SPANs that have a class

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jQuery fundamentals: selectors

- Position

```
$("a:first")
```

Selects first A we can find on the page

```
$("div:even")
```

Selects the "even" DIVs on a page

```
$("table#someTable td:first-child")
```

Selects the first cells within a tab named someTable

- Psuedo-classes (CSS filter selectors & custom selectors)

```
$("input:checked")
```

Selects checked inputs (including the ones that weren't checked initially)

```
$(":password")
```

Selects all INPUTs of type password

```
$("input:not(:checked)")
```

Selects all 'not-checked' inputs

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More selectors

- Full list at http://www.w3.org/TR/css3-selectors/

Pattern	Meaning
*	any element
E	an element of type E
E[foo]	an E element with a "foo" attribute
E[foo^="bar"]	an E element whose "foo" attribute value begins exactly with the string "bar"
E:nth-child(n)	an E element, the n-th child of its parent
E:first-child	an E element, first child of its parent
E:empty	an E element that has no children (including text nodes)
E:link E:visited	an E element being the source anchor of a hyperlink of which the target is not yet visited (:link) or already visited (:visited)
E > F	an F element child of an E element
E + F	an F element immediately preceded by an E element

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Selecting elements using selectors

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jQuery fundamentals: creating elements

- $('…') selects an element <> $('<li>') creates an element
  - Attributes can be passed using JavaScript object

```
 $(function(){
        $('<div>I’m
off</div>')
       .appendTo('body');
```

```
 $(function(){
        $('<img>', {
            src: 'someImage.jpg',
            alt: 'Some nice image'
          })
      .appendTo('body');
```

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Creating elements using $

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Working with the result of $

- Once we have a wrapped set, we can go wild with it!
  - Handle the set as a whole
  - Work with individual elements

Working with the result of $ (2)

- A wrapped set is like an array of elements, normal "array operations" can be done on it
  - Check the size

```
$('a').size();
```

  - Access an indiviual element

```
$('a') [0];
$('a').get(0);
```

  - Loop over the elements

```
$('img').each(function(n){
  this.alt='image['+n+']';
});
```

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Working with the result of $ (3)

- Set operations (continued)
  - Add and remove elements

```
$("a[class]").add("a[href]");
```

  - Filter elements

```
$("a").filter("[href^='http://']");
```

- Remember that we are always returning the set
  - Chaining is always possible!

```
$("a[class]")
      .add("a[href]")
      .filter("[href^='http://']")
      ...;
```

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Working with the set

Attributes

- When we want to change how an element looks, we can change its attributes
- jQuery provides the attr() method
  - 2 variations based on number and types of parameters
    - Read a specified property from first element in wrapped set

```
$("#myImage").attr("alt");
```

    - Set a property on all elements in the wrapped set (0 or more)

```
$('#myImage').attr('alt', ‘Me in Paris');
```

      - Can also accept a function
- Attr() helps us dealing with browser-dependencies (again)
  - jQuery float attribute refers to styleFloat in IE, cssFloat in others

```
$('a[href^=http://']).attr('target ', 'blank‘);
```

Attributes (2)

- jQuery makes it easy to apply and remove CSS classes
  - addClass(), removeClass(), toggleClass() and hasClass()
- Changing indiviual CSS elements is supported
  - css() can be used to get or set CSS on an element

```
$('#mydiv').css("background-color","yellow");
```

Working with elements

- html() can be used to get or set the content of an element

```
$('#mydiv').html();
```

Retrieves the HTML content Of mydiv

  - text() can retrieve combined textual content of all elements, including their children

- If the elements are form elements, we need to use val()

```
$('input:checkbox:checked').val();
```

Retrieves the value from a checked checkbox

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Working with attributes

Events

- A bit of history
  - Once upon a time, a browser called Netscape introduced an event model, often referred to as DOM Level 0 Event Model
    - Creates event handlers as references to a function on a property
    - Not what we need if we want to create Unobtrusive JavaScript
    - Only one event handler per element for specific event
  - Only got standardized until DOM Level 2 Event Model
    - Based on a system of event listeners (addEventListener)
    - IE decided to go its own way (attachEvent)
  - Using event was a real mess because of browser dependencies

  - jQuery comes to the rescue

jQuery events

- bind() is where it all starts
  - Binds a function to any event on any DOM element

```
$('#myimg')
      .bind('click',
            function(event){alert(Hello TechEd!');}
      );
```

  - Works in any browser, jQuery hides the details for us
  - Possible to bind more than one event handler f

    event on on element
- one() removes itself after event handler executed

Live and let die

- bind() is OK for existing elements
- live() allows us to create event handlers for elements that don’t exist (yet)

```
$('.someClass')
      .live('click',
            function() {
            //do something
        });
```

If new elements match the selector,
they get this event handler as well

- die() removes the live()-created event handlers

```
$(".someClass").die("click")
```

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Events

Animations and effects

- Core jQuery has some basic effects
  - More are available in jQuery UI
  - Should be used with caution!
- Most basic ‘animation’ is hiding/showing an element
  - hide(): sets display:none on the element
  - show(): sets display to inline/block
  - toggle(): sets visible is hidden and vice-versa
- Methods are overloaded, accepting
  - Speed
  - Callback

Animations and effects (2)

- Elements can also be gradually added/removed
  - slideDown() and slideUp()
- Fading in is supported as well
  - fadeIn() and fadeOut()
- animate() is mother of all animations
  - Using ‘target values’ for style properties, jQuery will animate the transition

```
$('.someClass').animate({opacity:0.25},'slow');
```

Change the opacity with a slow animation

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Animations

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Ajax in the past

- When we were all young (in 1998), Microsoft introduced the ability to perform asynchronous requests from script (ActiveX)
- Later, other browsers implemented a standard, the XMLHttpRequest
  - IE6 uses an ActiveX object
- Result is that we need to do checks

Looks ugly, doesn't it?

```
if(window.ActiveXObject) {
  xhr = new
ActiveXObject("Microsoft.XMLHTT
P");
   }
else if (window.XMLHttpRequest)
{
  xhr = new XMLHttpRequest();
}
```

- Again... jQuery to the rescue!

Ajax with jQuery

- Basic functionality to load content from a server-side resource:
  - load()
    - url
    - parameters: data to be passed (string, object...). If provided, a POST is executed, otherwise a GET
    - callback (optional)

```
$('#someDiv')
      .load('test.html',
            function() {
                  alert('Load was performed.');
      });
```

Loads the HTML page

- Next to load, we can also use $.get()/$.getJson() or $.post()

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Basic Ajax request with load()

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Ajax with jQuery(2)

- If we need all control over the Ajax request we can get:
  - $.ajax()
    - options: defines an object containing all the properties for the Ajax request
- List of options is huge, therefore
  - $.ajaxSetup
    - options: defines an object containing all the properties for the Ajax request, becoming the default for Ajax requests

```
$.ajaxSetup({
  type: 'POST',
  timeout: 5000,
  dataType: 'html'
});
```

Ajax with jQuery(3)

- Throughout the Ajax request, we can get feedback
  - Local events from the $.ajax() call (callbacks)
  - Global events
    - Are broadcast to every element within the DOM, can be attached on any element
      - ajaxStart
      - ajaxSend
      - ajaxSuccess
      - ajaxError
      - ajaxComplete

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More control with ajax()

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jQuery Ajax, ASP.NET MVC and WebForms

- jQuery can work in harmony with ASP.NET MVC and WebForms
  - Sample ajax() call for WebForms

```
$.ajax({
      type: "post",
      contentType: "application/json; charset=
      dataType: "json",
      url: "/Default.aspx/AddTask",
      data: JSON.stringify(dto)
});
```

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ASP.NET WebForms with jQuery

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ASP.NET MVC with jQuery

jQuery UI

- Huge extension of jQuery, providing more UI capabilities
- Contains number of UI features we'd logically need
- Includes
  - Effects: more advanced than core effects
  - Interactions: drag and drop
  - Widgets (aka controls): date picker...
  - All can be themed
- jqueryui.com contains tool to configure download and "ThemeRoller" tool
- Code included in jquery-ui.js

Effects

- jQuery core contains some basic effects
- Based on the effect(type, options, speed, callback) method
  - Has several animation types such as puff, highlight and shake (even explode exists)
  - Also allows to do animations with colors (not possible with animate())
    - backgroundColor, color...
- Visibility methods (show()...) are extended
- Class methods (addClass()...) are extended
- position() method is added for advanced positioning

```
$('#someElement').position({
  my: 'top center',
  at: 'bottom right',
  of: '#someOtherElement'});
```

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Effects

Interactions

- Interactions focus on allowing users to directly interact with elements, which isn't possible with standard HTML controls
  - They add advanced behaviors to our pages related to mouse interactions
- Available interactions:
  - Dragging
  - Dropping
  - Sorting
  - Resizing
  - Selecting

Dragging

- Easy-peasy (again) with jQuery
- draggable() is your friend (heavily overloaded once again)
  - Allows making elements draggable, possible with options (opacity...)

```
$('#someDiv').draggable();
```

  - Overloaded so it also support enabling, disabling... Draggable

```
$('.disableMe').draggable('disable');
```

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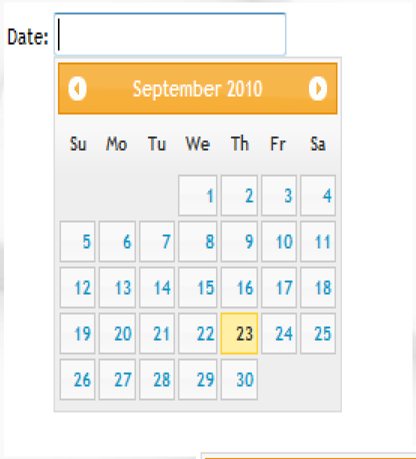
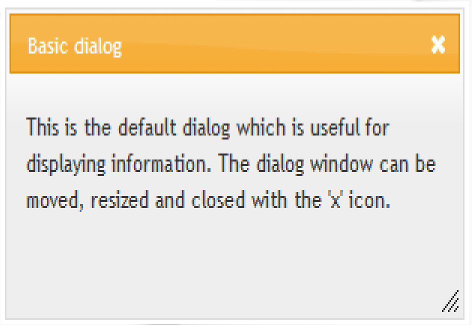
Dragging, dropping and other interactions

Widgets: controls on steroids

- New controls (based on existing ones)
- Contents
  - Buttons
  - Sliders
  - Progress bars
  - Autocompletion
  - Date picker
  - Tabs
  - Accordion
  - Dialog box





This is the default dialog which is useful for displaying information. The dialog window can be moved, resized and closed with the 'x' icon.

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Widgets in action

Something missing in jQuery?

- 2 options:
  - Use an existing plugin
    - jQuery plugin repository: plugins.jquery.com
    - Google code: code.google.com
    - SourceForge: sourceforge.net
    - GitHub: github.com
  - Write a plugin yourself
    - Custom utility function
    - Create wrapper functions

Writing your own plugins

- Write a plugin to add it yourself!
  - Possible to write your own utility functions and wrapper methods
- Creating new wrapper methods:
  - Add the method as a property on the fn object in the $ namespace

```
$.fn.wrapperFunctionName =
function(params){function-body};
```

```
(function($){
  $.fn.setToRed = function() {
    return this.css('color','red');
  };
})(jQuery);
```

We are passing jQuery to a function that has $ as parameter. This way, $ will inside this function, always be the jQuery $

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Writing a plugin

Breaking news!

- **October 4th 2010**: jQuery has accepted 3 plugins from Microsoft
  - jQuery Templates
  - jQuery Data Link
  - jQuery Globalization
- Are now official plugins
- Templates were supposed to be standard part of next major jQuery version
  - Didn’t happen though...

jQuery Templates

- Template is HTML markup (containing tags)

```
<script id="movieTemplate" type="text/x-jquery-tmpl"
   <li><b>${Name}</b> (${ReleaseYear})</li>
</script>
```

- 3 plugins:
  - .tmpl(): renders the template
  - .tmplItem(): find the template item
  - .template(): compile the template

```
$("#movieTemplate").tmpl(movies)
                .appendTo("#movieList");
```

jQuery Templates (2)

- Container for the template can be
  - Inline markup
  - String (computed or downloaded)
- Can be retrieved using

```
$( selector ).tmpl( data )
```

  - Selector is container (div...)
    - Can result in invalid HTML (due to tags)
    - Browser may start to load in this HTML
  - Best to place it within script tag

```
<script id="myContainer" type="text/x-jquery-tmpl"
```

.tmpl()

- Take the first element in the matched set and render its content as a template, using the specified data
- .tmpl([data], [options])
  - Data: The data to render. Can be any JavaScript type, including Array or Object
  - Options: An optional map of user-defined key-value pairs

```
$( "#myTemplate" ).tmpl( myData )
```

- Can be used with local data, mostly remote data (ajax)

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jQuery Templates

jQuery Data Link

- Data linking is the data binding engine of jQuery
  - Allows linking a field of an object to a field of another object
- Available through the .link() function

```
var person = {};
$("form").link(person);
```

  - When a value of a field changes, the property on the object is changed as well
    - Links are two-way by default

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jQuery Data Link

jQuery Globalization

- Includes globalization information for over 350 (!) cultures
  - Currencies
  - Date formatting (month names)
  - Number formatting
- Uses the standardized culture identifications
  - Ex. nl-BE ← a great culture ;-)

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jQuery Globalization

Where to get your stuff?

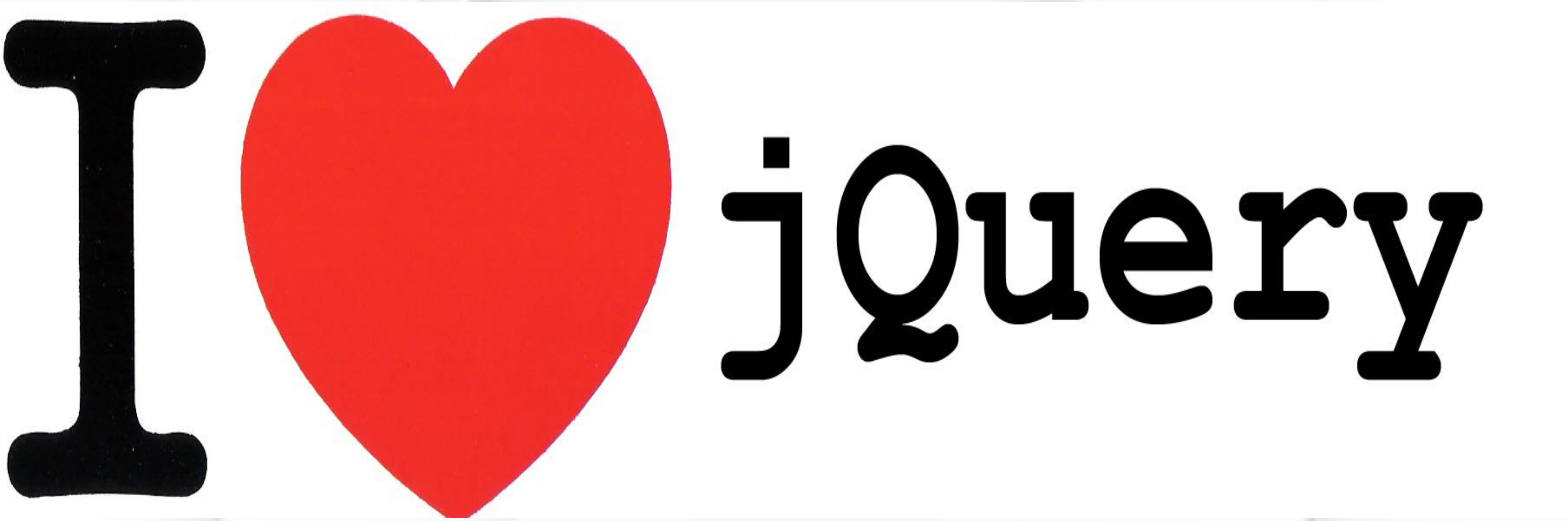
- Use a CDN?
  - Microsoft
  - Google
- Put scripts locally as well with a fallback mechanism

```
<script type="text/javascript"
      src="http://ajax.microsoft.com/ajax/jquery/jquery-1.4.2.mi
</script>
<script type="text/javascript">
if (typeof jQuery == 'undefined')
{
    document.write(unescape("%3Cscript src='/Scripts/jquery-1.4.2
      type='text/javascript'%3E%3C/script%3E"));
}
</script>
```

Summary

- Where does all the (l) for jQuery come from?
  - Light-weight library that uses JavaScript as JavaScript, relying on CSS
  - Cross-browser compatible, hides the details (ready handler)
  - Easy eventing model
  - Can work with MVC & WebForms
  - Easily extensible to fit your needs, tons of plugins already available

So I hope you now say too...



Thanks!

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