AJAX with ASP.NET MVC

$.ajax({…})

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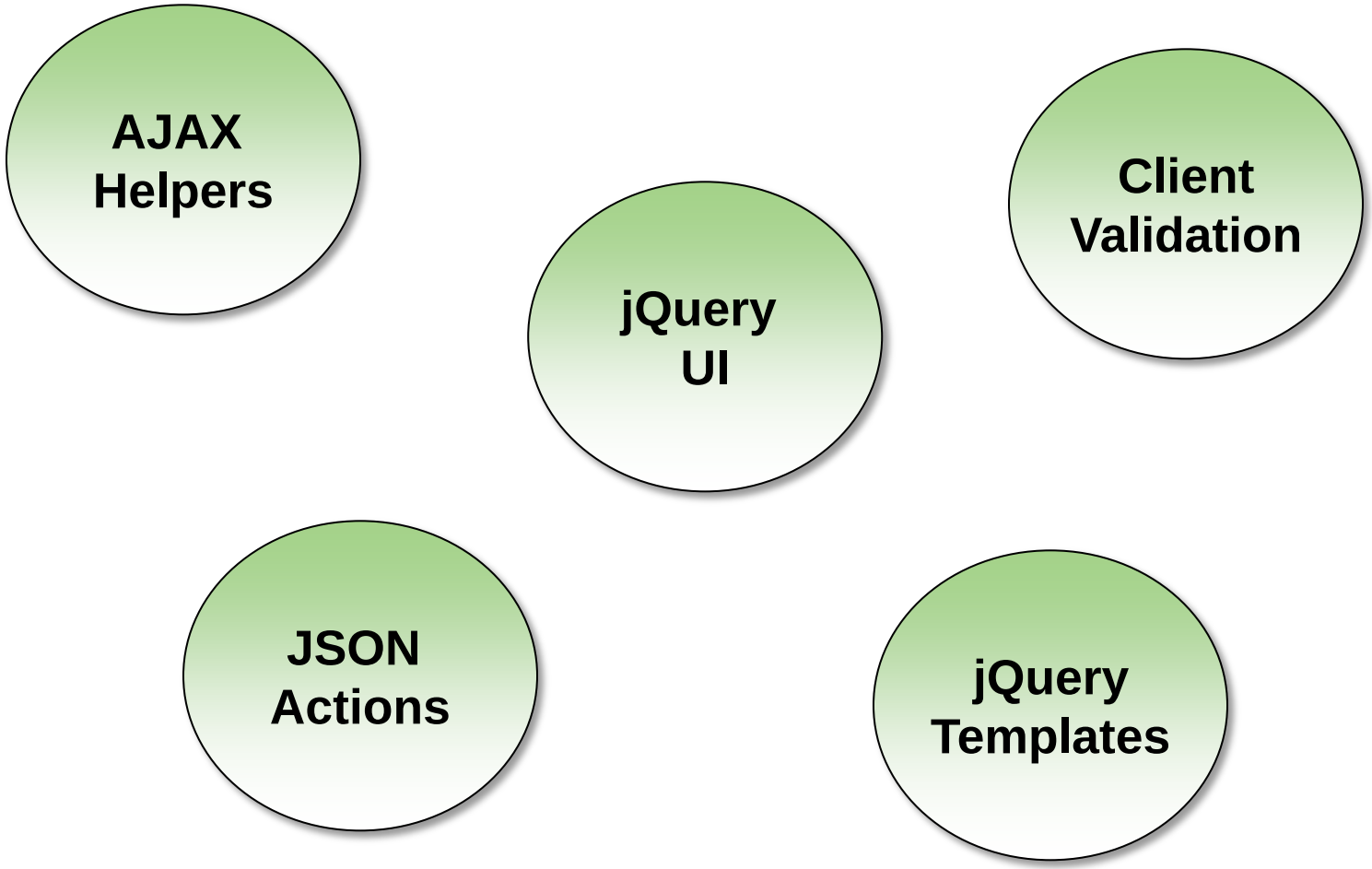
Overview

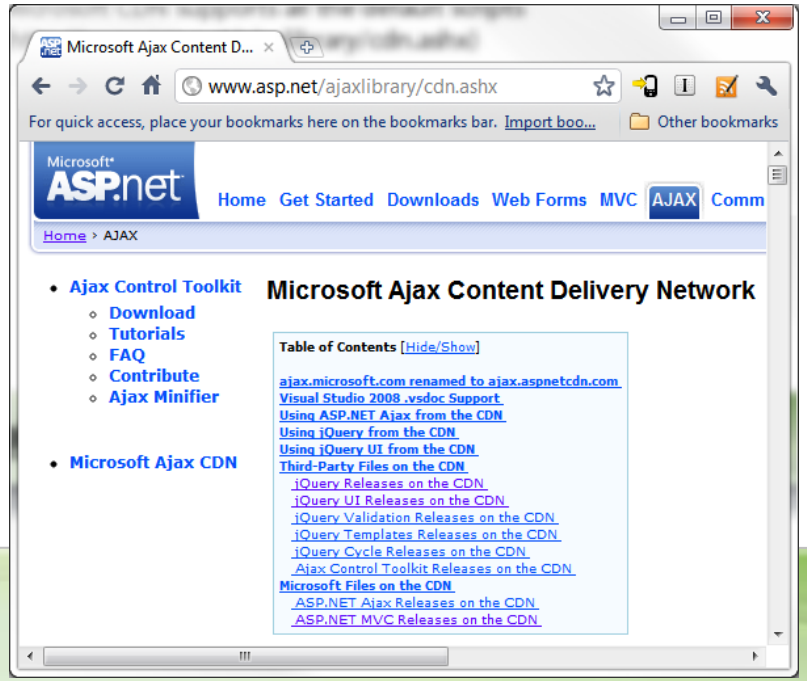

AJAX Helpers
jQuery UI
Client Validation
JSON Actions
jQuery Templates

AJAX Infrastructure

- **Microsoft AJAX (optional)**
  - Component orientation
  - OOP Style
  - Gives CLR flavor to JavaScript
  - Support for WCF and JSON
- **jQuery (preferred)**
  - Functional orientation
  - Plug-in oriented
  - CSS Selectors
  - DOM Manipulation

Managing Scripts

- **Where do I place script tags?**
  - Inside the <head> or at the bottom of a page?
- **Scripts and content delivery networks**
  - Use them for faster load times
  - Microsoft CDN supports all the default scripts (http://www.asp.net/ajaxlibrary/cdn.ashx)



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Ajax Helpers

- Create links and forms that send async requests

```
<div id="timeDisplay">
    <%= Ajax.ActionLink("Click here to set the server time",
                        "ServerTime",
                        new AjaxOptions
                        {
                            UpdateTargetId="timeDisplay",
                            HttpMethod="GET", // default
                            InsertionMode= InsertionMode.Replace, // default
                        })
    %>
</div>
```

Unobtrusive JavaScript

- **No script injected into page**
  - Only data- attributes with nessecary AJAX settings
- **Requires unobtrusive extensions script**
  - jquery.unobtrusive-ajax.js (AJAX helpers)
  - jquery.validate.unobtrusive.js (Client validation)

```
<div id="latestReview">
    <a data-ajax="true" data-ajax-loading="#progress" data-ajax-method="GET"
       data-ajax-mode="replace" data-ajax-update="#latestReview"
       href="/Home/LatestReview">Click here to see the latest review</a>
</div>
```

AjaxOptions

- **Includes events for**
  - OnBegin
  - OnComplete
  - OnFailure
  - OnSuccess
- **Confirmation prompt**

```
<%= Ajax.ActionLink("Click here to set the server time",
                    "ServerTime",
                    new AjaxOptions
                    {
                        LoadingElementId="loadingDisplay",
                        Confirm="Are you sure?",
                        UpdateTargetId="timeDisplay",
                    })
%>
```

```
<div id="loadingDisplay" style="display:none">
    <img src="../../Content/spinner.gif" />
</div>
```

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Partial Page Rendering

- Use PartialViewResults in controller actions

```
if (Request.IsAjaxRequest())
{
    return PartialView("MovieTable", movies);
}

return View("Index", movies);
```

```
<% using (Ajax.BeginForm("Index", "Movie",
                new AjaxOptions { HttpMethod="GET",
                                  UpdateTargetId="movieTable" }))
   { %>
        <input type="text" name="q" />
        <input type="submit" value="Search" />
<% } %>
```

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Ajax Helpers and Errors

- Default behavior is to fail silently
- Override default by specifying OnFailure option

```
function searchFailed(ajaxContext) {
    var response = ajaxContext.get_response();
    var element = ajaxContext.get_updateTarget();
    element.innerHTML = "Error: server returned a " +
                        response.get_statusCode();
}
```

Client Validation

- Based on model annotations ([Required])
- Requires jQuery validation plug-in (provided)
- Enabled by default in web.config
- Completely unobstrusive!
  - HTML "data-" attributes

```
<%
    Html.EnableClientValidation(false);
%>
```

Custom Client Validations

- **1. Implement IClientValidatable**
  - In attributes or in self-validating models
- **2. Write a jQuery validation adapter**
  - Maps metadata to validation rules

```
public IEnumerable<ModelClientValidationRule>
    GetClientValidationRules(
        ModelMetadata metadata,
        ControllerContext context)
{
    var rule = new ModelClientValidationRule(
    rule.ErrorMessage = FormatErrorMessage(me
    rule.ValidationParameters["maxwords"] = M
    rule.ValidationType = "wordcount";
    yield return rule;
}
```

```
jQuery.validator.unobtrusive.adapters.addSingleVal(
    "wordcount", "maxwords");

jQuery.validator.addMethod("wordcount",
        function (value, element, maxWords) {
   if (value) {
        var wordCount = value.split(' ').length;
        if (wordCount <= maxWords) {
            return true;
        }
        return false;
    }
    return true;
});
```

Remote Validation

- **Because some validations are impossible on the client-side**
  - Require a database lookup, for example

```
[Remote("UsernameCheck", ErrorMessage="Invalid username")]
public string Username { get; set; }
```

Beyond the Built-in Helpers

- **Ajax Helpers cover simple scenarios**
  - Replacing HTML content
  - Partial page rendering
- **Other scenarios require some JavaScript coding**
  - Auto-complete textboxes
  - Client-side validation
  - Invoking JSON services and actions
  - Animations

Auto-Complete

- **jQuery auto-complete plug-in**
  - Included in jQuery UI script

```
$(function() {
   $("#searchBox").autocomplete("/Movie/SearchCandidates",
                                { minChars: 3 });
});
```

```
public string SearchCandidates(string q, int limit)
{
    var ctx = new MoviesContext();
    var movies = ctx.MovieSet
                    .Where(m => m.Title.StartsWith(q))
                    .OrderByDescending(m => m.ReleaseDate)
                    .Take(limit)
                    .Select(m => m.Title);

    return String.Join(Environment.NewLine, movies.ToArray());

}
```

Date Pickers and Other Widgets

- **Many lightweight jQuery widgets available from jQuery UI**
  - http://jqueryui.com/
  - Calendar
  - Accordion
  - Slider
  - Dialog
  - Tab
  - Progress Bar

```
$(".create #ReleaseDate").datepicker();
```

JSON & MVC

- JsonResult will serialize objects to JSON
- jQuery and ASP.NET AJAX can work with JSON

```
$.getJSON("/Instructor/InstructorNames", "", function(data) {
  $(data).each(function() {
    …
  });
});
```

```
public JsonResult InstructorNames()
{
    var repository = new InstructorRepository();
    var names =
            from i in repository.FindAll()
            select new
            {
                ID = i.ID,
                Name = i.Name
            };
    return Json(names);
}
```

WCF Services

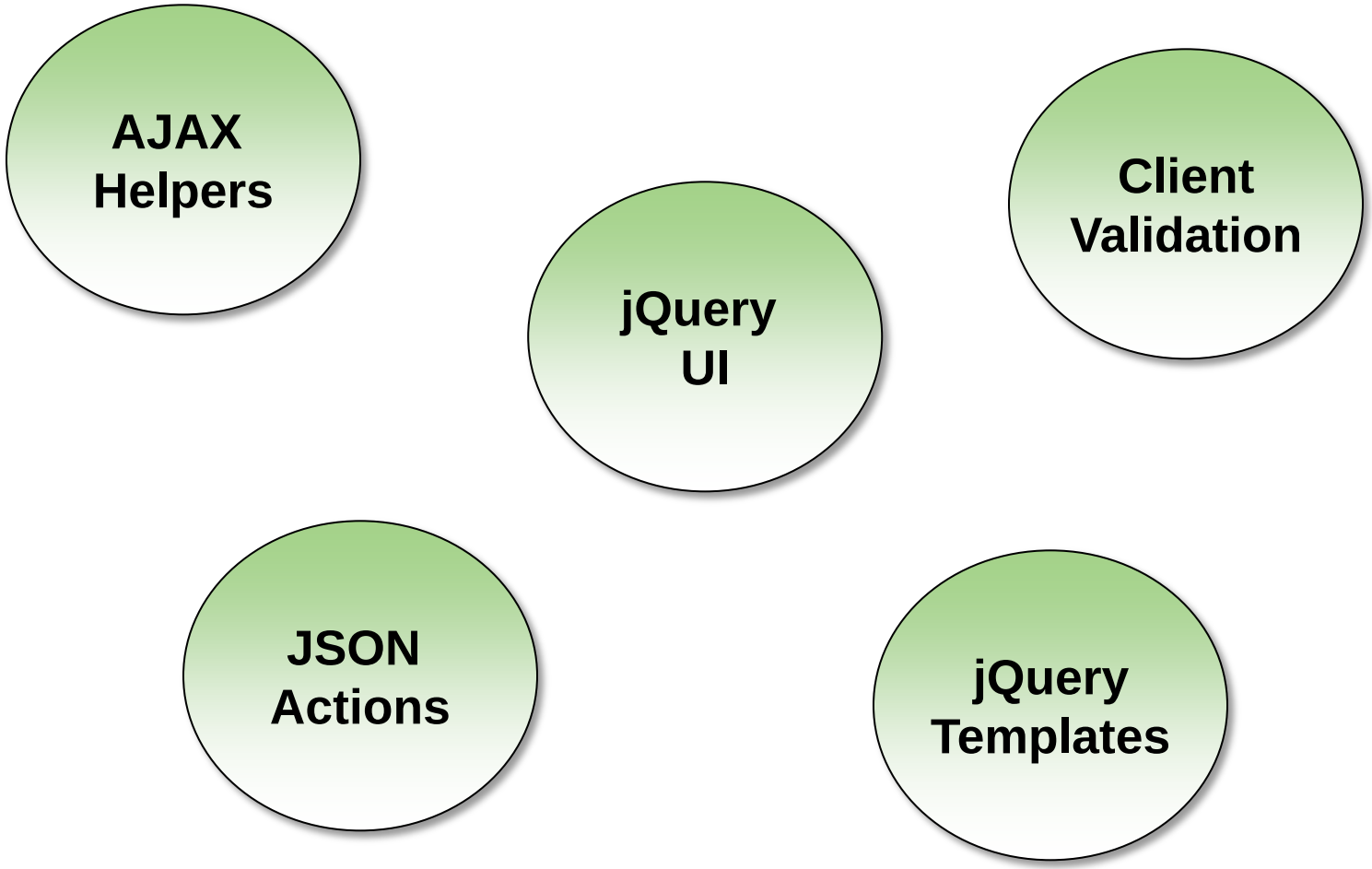
- Available through ASP.NET AJAX proxies

```
<script src="../../Services/InstructorService.svc/js" type="text/javascript"></script>
```

```
var service = new InstructorService();
service.GetInstructorNames(function(result) {
    $(result).each(function() {
        $("<option>").val(this.ID)
                     .text(this.Name)
                     .appendTo("#instructorSelect");
    });
});
```

```
[OperationContract]
public Instructor GetInstructorDetails(int id)
{
    var repository = new InstructorRepository();
    var instructor = repository.FindByID(id);
    return instructor;
}
```

Summary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