3.– 6. September 2012
in Nürnberg

Herbstcampus

Wissenstransfer
par excellence

Programming Windows Store Apps with JavaScript and WinRT

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Introduction

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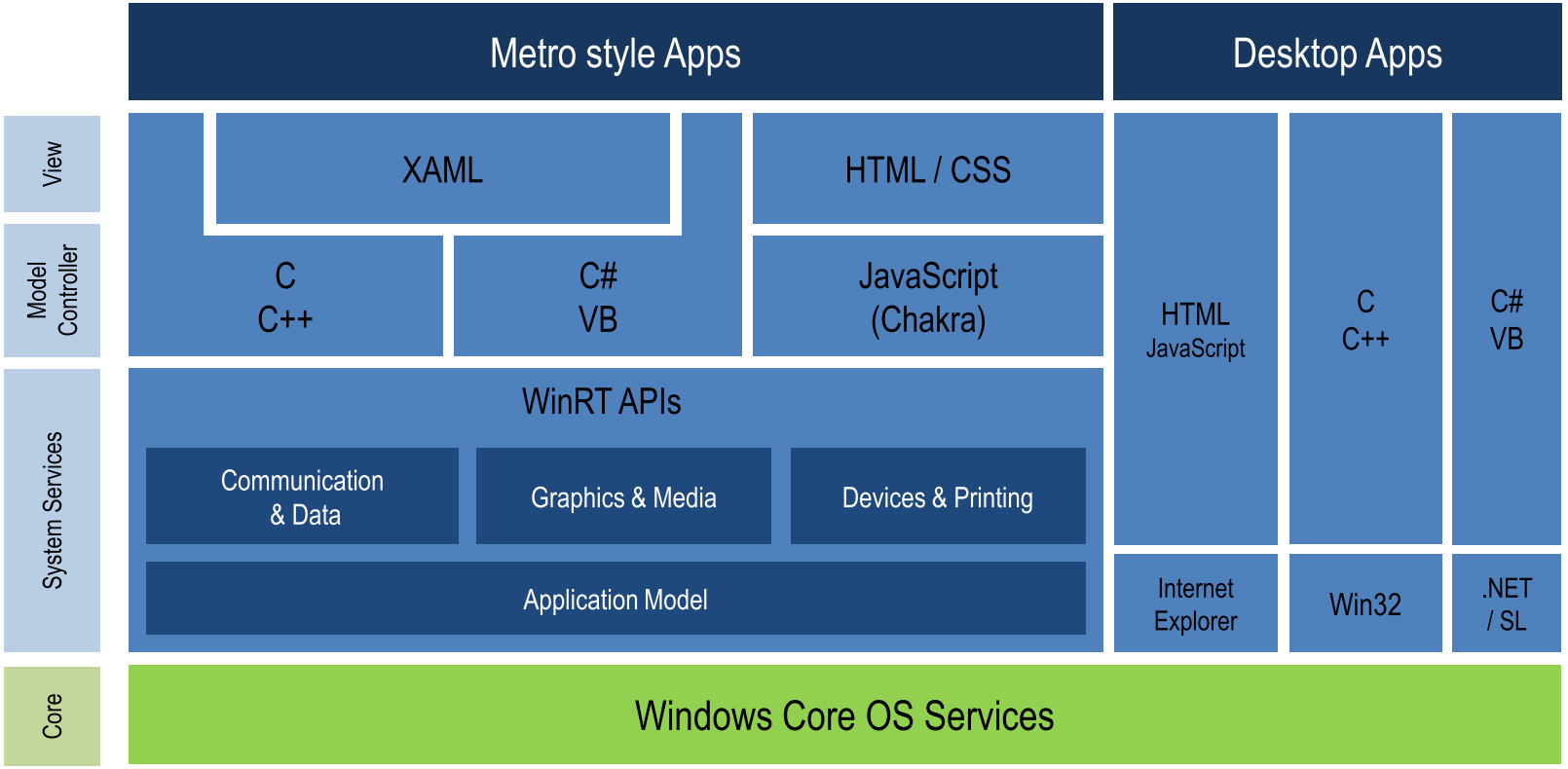
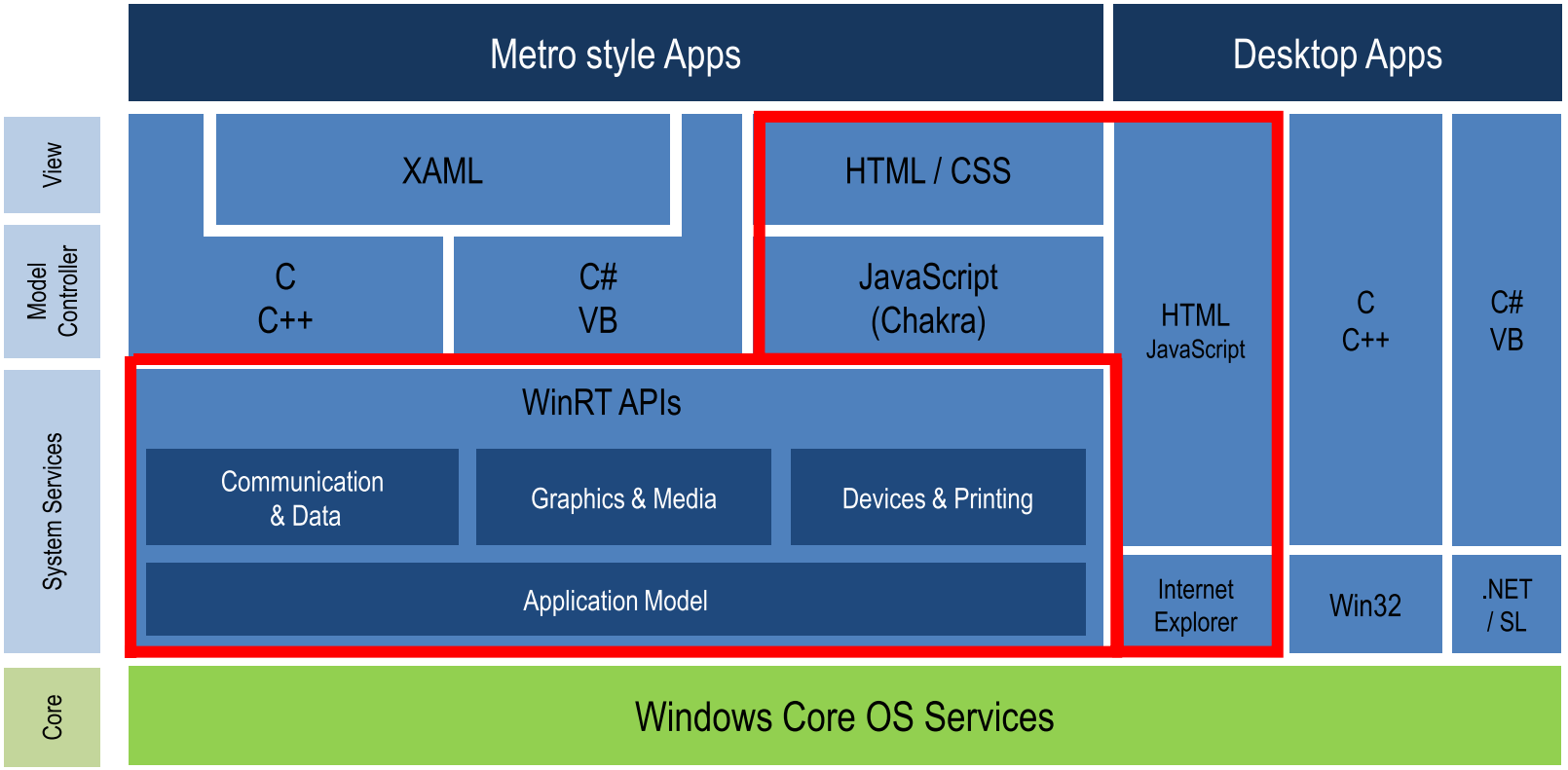
WinRT System Architecture



WinRT System Architecture



Windows Store Apps in JavaScript?

Goals…

- Reuse existing knowledge from the web for developing Windows applications
- HTML + JavaScript are 1st class citizens for developing Windows Store Apps
- "Fast and Fluid" also with HTML + JavaScript

Prerequisites…

- Use all the technologies you know from IE 10: HTML5 + CSS3 + JavaScript
- Full access to platform API (WinRT)
- Hardware Acceleration, Plugin-Free, etc.

Goals of This Session

- Build a Windows Store App from scratch using HTML + JavaScript
- Introduce the WinJS Library
- Access API of Windows 8 (WinRT) from JavaScript
- One integrated demo used throughout the entire session

Non-Goals of the Session:

- General HTML/CSS/JavaScript introduction
- Training about WinJS, WinRT or Windows Store Apps

Tip: Download slides and check hidden slides for code snippets

Important Notice

- **For demo purposes** the sample has been simplified compared to a real-world Windows Store app
- In practise you have to remember additional requirements in order to get your app into the Windows Store, e.g.:
  - Handle different screen resolutions and view modes (e.g. portrait/landscape, snapped, etc.; read more)
  - Support navigation patterns (e.g. links, back/forward, etc.; read more)
  - App Lifecycle (e.g. launch, activation, suspend, etc.; read more)

JavaScript Module Pattern

```
(function ( ) {
    // create variable
    // var name = "Andi und Rainer";

    // create method
    // var sayHello = function ( ) {
    //    alert(name);
    // };
})( ); // calling this method.
```

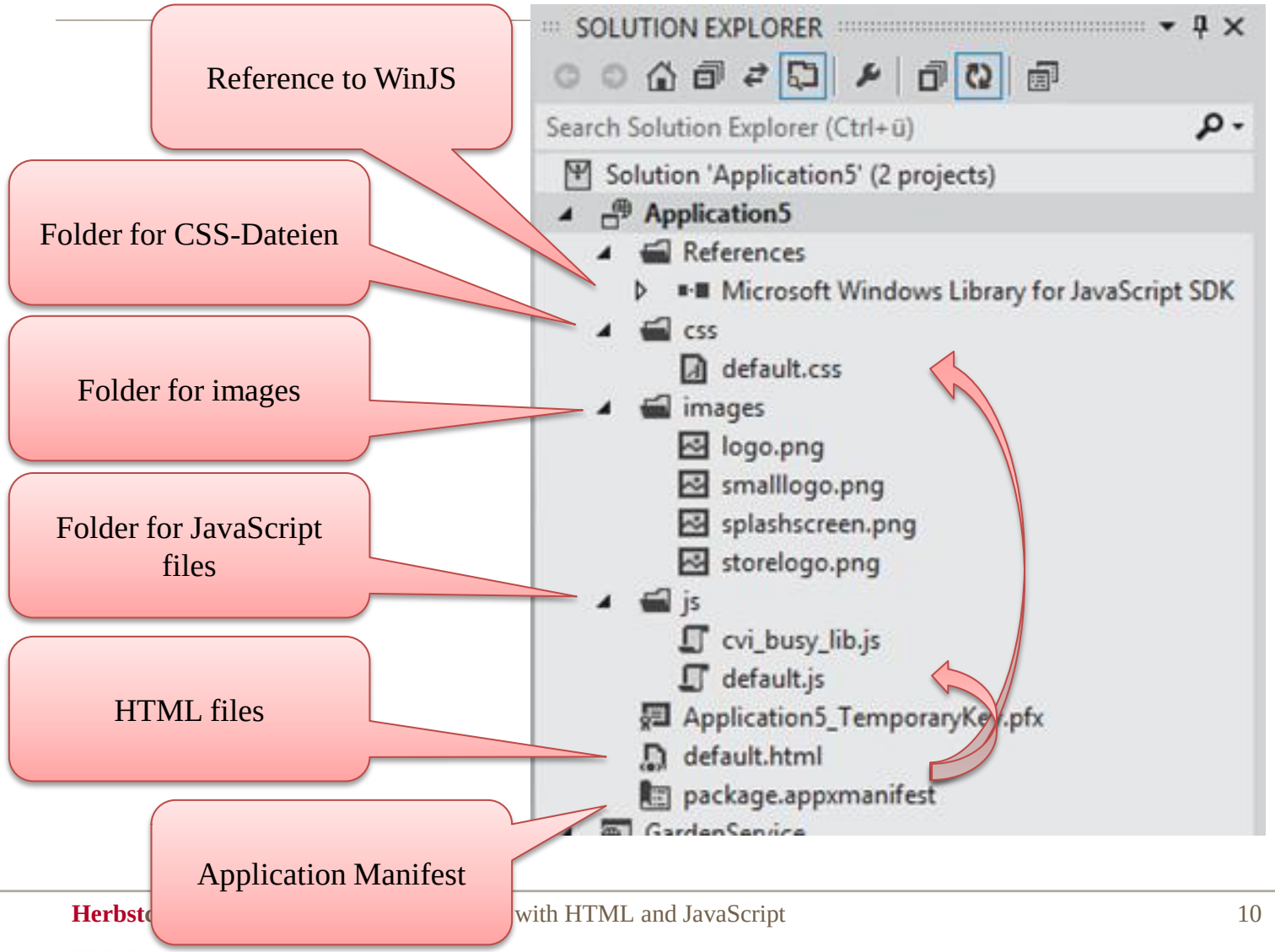
It is plain old JavaScript, also for Windows Store Apps!

Demo

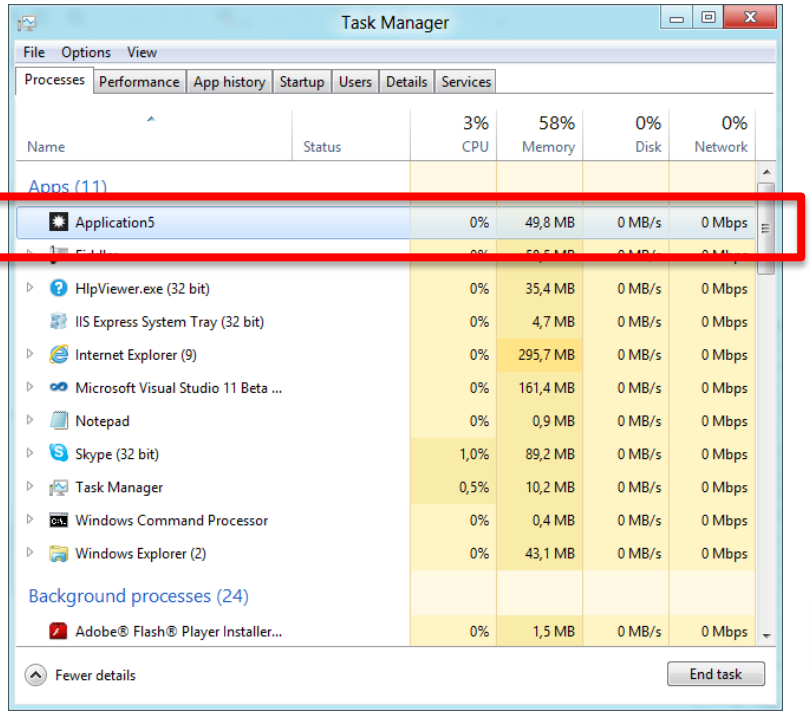
- Structure of a JavaScript Windows Store App
- Runtime environment for JavaScript Apps

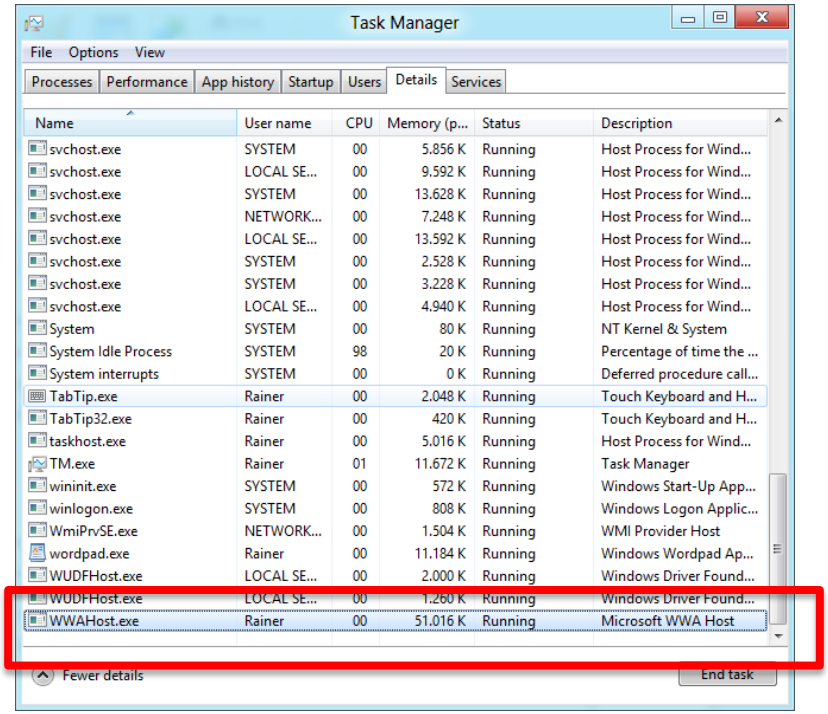
Background information in MSDN

Structure of a JavaScript App



Structure of a JavaScript App





Demo

- Controls and Data Binding

ListView, a WinJS Control

```
<!-- add a WinJS control in HTML -->
<div class="itemlist" data-win-control="WinJS.UI.ListView" […]></div>


// find control in DOM tree
var lv = document.body.querySelector(".itemlist");

// fill WinJS list (=data source for ListView)
var items = new WinJS.Binding.List();
for (var i = 1000; i < 1500; i++) {
    items.push("Hello World!");
}

WinJS.UI.processAll().then(function() {
    lv.winControl.itemDataSource = items.dataSource;
}
```

Demo

- Templates and Data Binding

ListView, a WinJS Control

```
<div class="splitpage">
     <div class="itemtemplate" data-win-control="WinJS.Binding.Template">
          <div><img src="#" data-win-bind="src: ImageUri; alt: Title" style="width: 100px" /></div>
          <div class="item-info"><h3 class="item-title win-type-ellipsis" data-win-bind="textContent: Title"></h3></div>
     </div>
     <header aria-label="Header content" role="banner"><h1>Garden Blog</h1></header>
     <section class="itemlistsection" aria-label="List section">
          <div class="itemlist" aria-label="List of this group's items" data-win-control="WinJS.UI.ListView"
               data-win-options="{ selectionMode: 'single', tapBehavior: 'directSelect' }">
          </div>
     </section>
     <section class="articlesection" aria-atomic="true" aria-label="Item detail" aria-live="assertive">
          <header class="header">
               <div class="text"><h2 data-win-bind="textContent: Title"></h2></div>
               <div>
                    <img class="article-image" src="#" data-win-bind="src: ImageUri; alt: Title"
                         style="width: 150px; max-height: 150px" />
               </div>
          </header>
          <article class="article-content" data-win-bind="innerHTML: Text"></article>
     </section>
</div>
```

ListView, a WinJS Control

```
function onselectionchanged(eventObject) {
    var listView = document.body.querySelector(".itemlist").winControl;
    // By default, the selection is restriced to a single item.
    listView.selection.getItems().then(function (items) {
        if (items.length > 0 && items[0]) {
            var details = document.querySelector(".articlesection");
            WinJS.Binding.processAll(details, items[0].data);
            details.scrollTop = 0;
        }
    })
}
```

Root node for data binding

Data Context for data binding

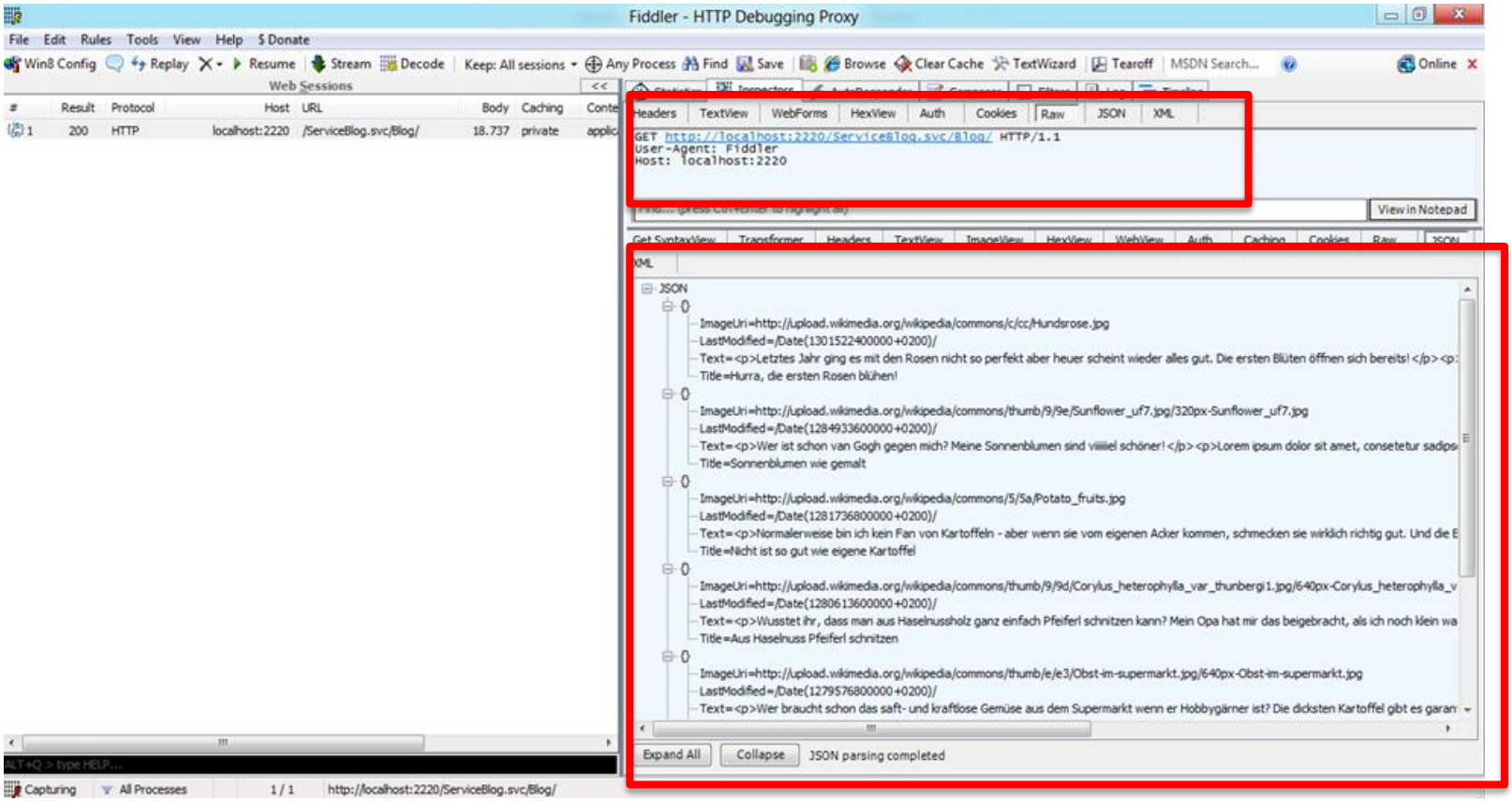
ListView, a WinJS Control

```
WinJS.UI.setOptions(lv.winControl, {
    itemTemplate: document.body.querySelector(".itemtemplate"),
    onselectionchanged: onselectionchanged.bind(this),
    itemDataSource: items.dataSource,
    layout: new WinJS.UI.ListLayout()
});
lv.winControl.selection.set(0);
```

Demo

- Working with REST Services

REST Service in Fiddler



WinJS.xhr

```
function refreshBlogList() {
    WinJS.xhr({ url: "http://localhost:2220/ServiceBlog.svc/Blog/" }).done(function (feedResponse) {
        // convert feed to list of bindable objects
        var feed = JSON.parse(feedResponse.responseText);
        var items = new WinJS.Binding.List(feed);

        // set properties of list view (including data source for binding)
        var lv = document.body.querySelector(".itemlist");
        WinJS.UI.setOptions(lv.winControl, {
            itemTemplate: document.body.querySelector(".itemtemplate"),
            onselectionchanged: onselectionchanged.bind(this),
            itemDataSource: items.dataSource,
            layout: new WinJS.UI.ListLayout()
        });

        // automatically select first item
        lv.winControl.selection.set(0);
    });
}
```

WinJS.xhr

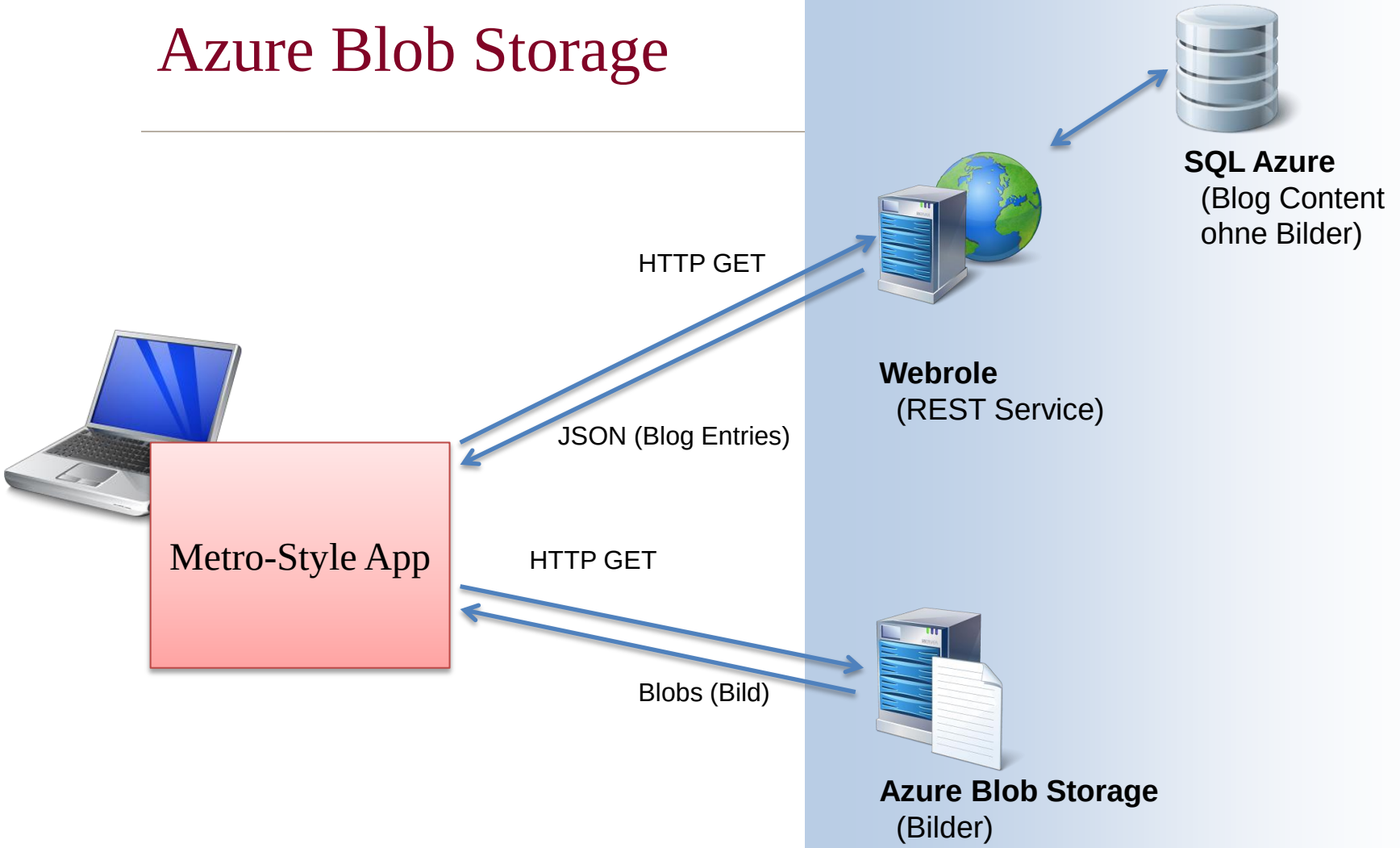
```
app.onactivated = function (eventObject) {
    // lookup list view in DOM
    var lv = document.body.querySelector(".itemlist");

    WinJS.UI.processAll().then(function () {
        refreshBlogList();
    });
}
```

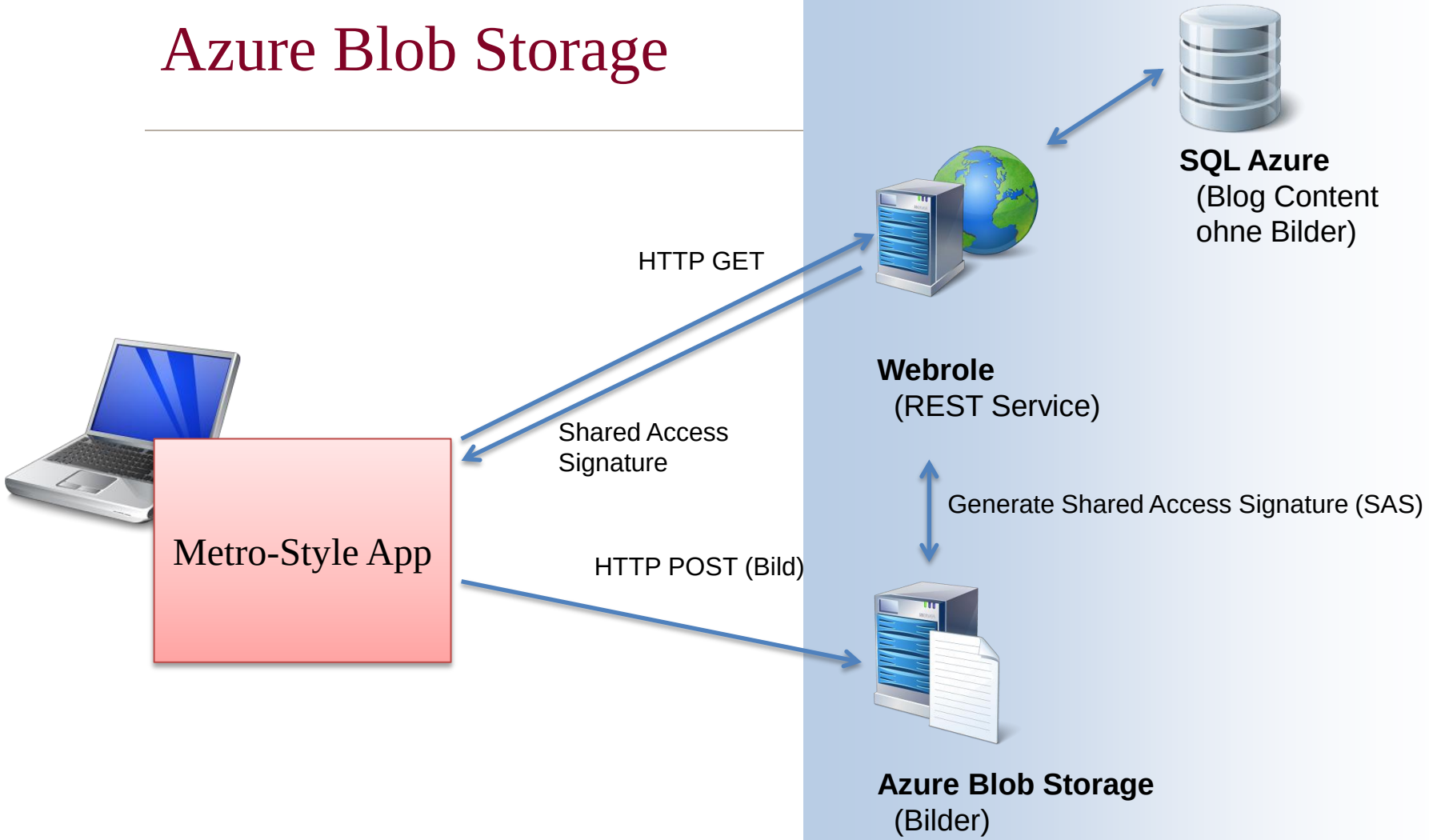
Demo

- AppBar, XHR and Azure

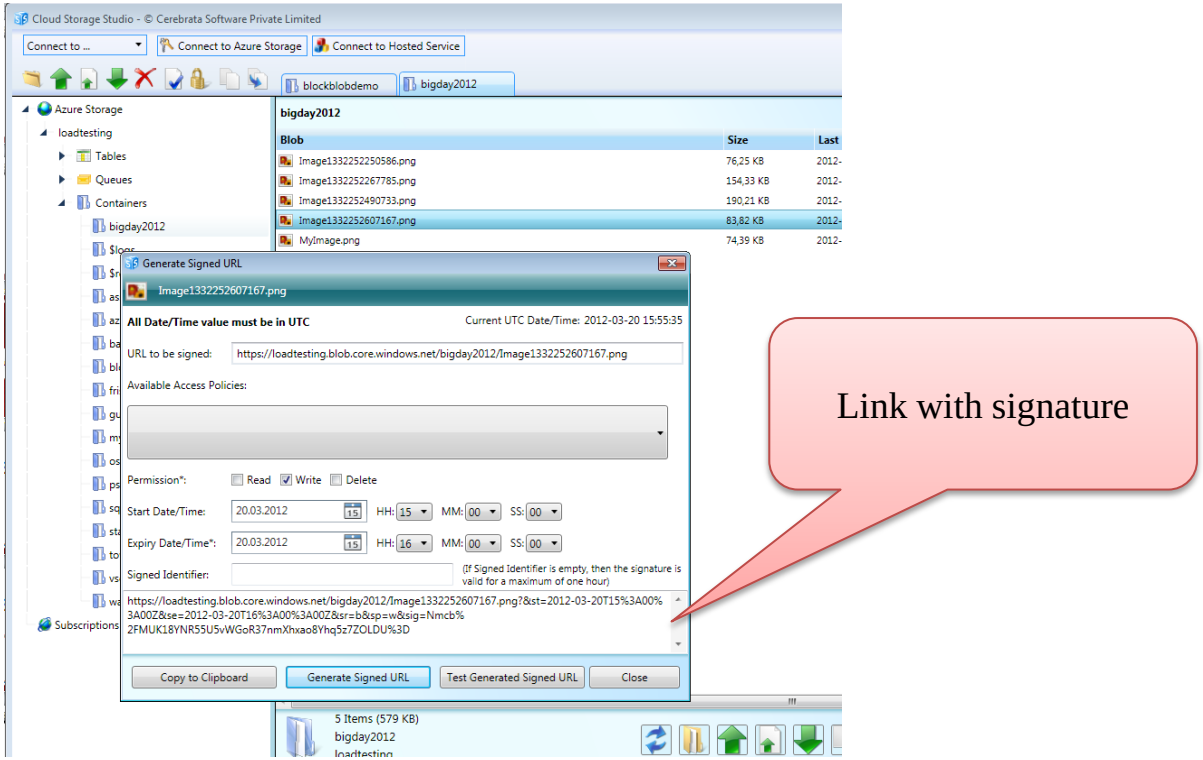
Azure Blob Storage



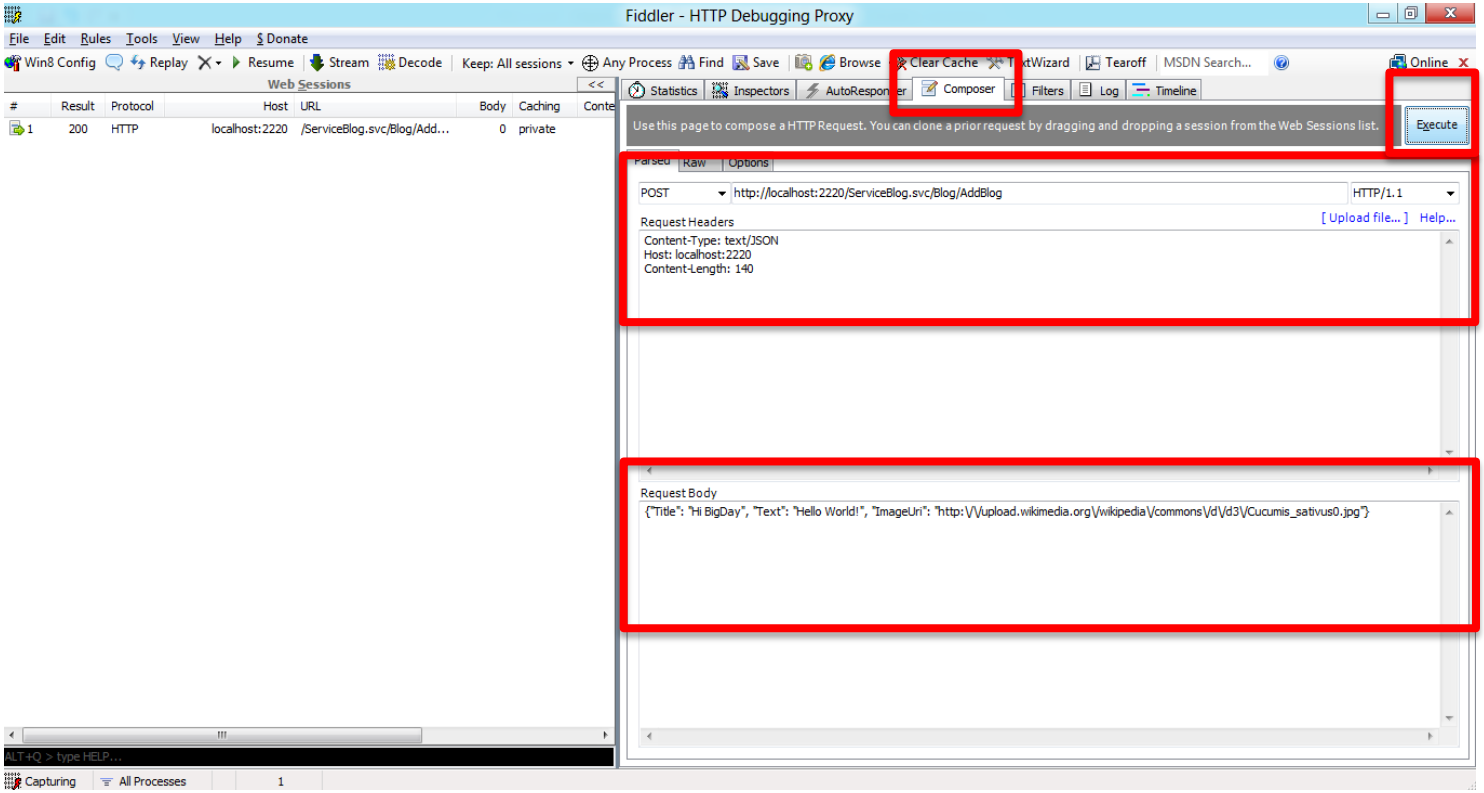
Azure Blob Storage



Azure Shared Access Signatures



INSERT with REST Service



Adding an AppBar

```
<div id="appbar" data-win-control="WinJS.UI.AppBar">
    <button data-win-control="WinJS.UI.AppBarCommand"
        data-win-options="{id:'cmd', label:'Create Entry', icon:'placeholder'}">
    </button>
    <button data-win-control="WinJS.UI.AppBarCommand"
        data-win-options="{id:'refresh', label:'Refresh', icon:'placeholder'}">
    </button>
</div>

// add button handler for appbar button
var cmdButton = document.getElementById("cmd");
cmdButton.onclick = onPostBlogEntryClick;
var refreshButton = document.getElementById("refresh");
refreshButton.onclick = refreshBlogList;
```

Using WinRT to Access the Webcam

```
function onPostBlogEntryClick() {
    // let user take a picture. Note that we use WinRT classes here.
    var capture = Windows.Media.Capture;
    var cameraCaptureUI = new capture.CameraCaptureUI();

cameraCaptureUI.captureFileAsync(capture.CameraCaptureUIMode.photo).then(
        function (capturedItem) {
            if (capturedItem) {
                […]
            }
        });
}
```

Using WinRT to Access the Webcam

```
if (capturedItem) {
      var rootDiv = document.body.querySelector(".itemlist");
      var busy = getBusyOverlay(rootDiv, { color: 'gray', opacity: 0.25 }, { type: 'oval', color: '#FFFFFF' });

      WinJS.xhr({ url: "http://localhost:2220/ServiceBlog.svc/Blog/GetSasForImage/" + imageName })
      .done(function (result) {
            var uploader = new Windows.Networking.BackgroundTransfer.BackgroundUploader();
            uploader.method = "PUT";
            uploader.setSourceFile(capturedItem);
            var uri = new Windows.Foundation.Uri(JSON.parse(result.responseText));
            var upload = uploader.createUpload(uri);
            upload.startAsync().done(function (result) {
                  WinJS.xhr({ url: "http://localhost:2220/ServiceBlog.svc/Blog/AddBlog", data: JSON.stringify(newEntry),
                        type: "POST", headers: { "Content-Type": "text/JSON" } }).done(function () {
                        busy.remove();
                        refreshBlogList();
                  });
            },
            function (err) {
                  busy.remove();
            });
      });
}
```

Demo

- Share Contract

Implement the Share Contract

```
var dtm = Windows.ApplicationModel.DataTransfer.DataTransferManager.getForCurrentView();
dtm.addEventListener("datarequested", function (e) {
        // capture request member
        var request = e.request;

        // get selected item from list view
        var lv = document.body.querySelector(".itemlist").winControl;
        lv.selection.getItems().then(function (items) {
                if (items.length > 0) {
                        var item = items[0].data;

                        // set request title and description
                        request.data.properties.title = item.Title;
                        request.data.properties.description = "Garden Blog";

                        // set text content
                        var recipe = item.Text;
                        request.data.setText(recipe);

                        // set image content
                        // note that we use deferral-API here.
                        // (only do this if your operation is quite fast; 200ms time limit or so)
                        var uri = new Windows.Foundation.Uri(item.ImageUri);
                        var reference = Windows.Storage.Streams.RandomAccessStreamReference.createFromUri(uri);
                        request.data.properties.thumbnail = reference;
                        var deferral = request.getDeferral();
                        request.data.setBitmap(reference);
                        deferral.complete();
                }
        });
});
```

Summary

What you have seen…

- Structure of a Windows Store App with HTML + JavaScript
- Introduction into WinJS
- Accessing Windows 8 API (WinRT) from JavaScript

Use your existing knowlege about HTML and JavaScript for Windows Store Apps

Further readings:

- http://dev.windows.com
- http://design.windows.com

Vielen Dank!

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software architects gmbh

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