# Integrating Windows 8 WinJS Metro App with HealthVault Part II

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In this second part of this article we will look at how to access HealthVault data from a Windows 8 application using WinJS (HTML/CSS/Javascript). We will continue from Part I were we setup the initial infrastructure to have the Win8 app connect

We will be taking key learning’s from Asthma Journal available for download on GitHub.

## Saving HealthVault Users

First thing we are going to have to do is save a list of HealthVault users accessing the system and save the authorization token.

1. In your models directory, create a new class called **HealthVaultUser.cs** and implement as follows

/// <summary>

/// Represents a healthvault user

/// </summary>

public class HealthVaultUser

{

/// <summary>

/// The Id for the record

/// </summary>

public int Id { get; set; }

/// <summary>

/// The user id associated with this healthvault record

/// </summary>

public Guid UserId { get; set; }

/// <summary>

/// The name of the healthvault user since the username in asp.net membership is a guid

/// </summary>

public string Name { get; set; }

/// <summary>

/// The HealthVault person id

/// </summary>

public Guid PersonId { get; set; }

/// <summary>

/// The record id for the health person record, not the same as personId

/// </summary>

public Guid RecordId { get; set; }

/// <summary>

/// The HealthVault Selected Record ID

/// </summary>

public Guid AuthorizedRecordId { get; set; }

/// <summary>

/// The serialized person info object

/// </summary>

public string PersonInfoObject { get; set; }

/// <summary>

/// The token returned by health vault.

/// </summary>

public string WCToken { get; set; }

/// <summary>

/// Determins whether there is access to the record

/// </summary>

public string HealthRecordState { get; set; }

}

1. Open up **HVDbContext.cs** and add the following property

/// <summary>

/// HealthVault users

/// </summary>

public DbSet<HealthVaultUser> HealthVaultUsers { get; set; }

1. In the Controllers directory, open **AccountController.cs** and locate the **Login** method
2. Add the following line before the HVUserImageHelper.Default.SaveImageToBlobStorage call

// save the user to the local table

SaveUser(personInfo, authToken);

1. Implement the SaveUser method as follows

private void SaveUser(PersonInfo personInfo, string token)

{

// create a new context

var context = new HVDbContext();

// check if the user already exists

var user = (from t in context.HealthVaultUsers

where t.PersonId.ToString().Equals(personInfo.PersonId.ToString())

select t).FirstOrDefault();

if (user == null)

{

// add user to collection

context.HealthVaultUsers.Add(new HealthVaultUser()

{

HealthRecordState = personInfo.SelectedRecord.State.ToString(),

Name = personInfo.SelectedRecord.Name,

PersonId = personInfo.PersonId,

WCToken = token,

PersonInfoObject = personInfo.GetXml()

});

}

else

{

// update the user

user.HealthRecordState = personInfo.SelectedRecord.State.ToString();

user.Name = personInfo.SelectedRecord.Name;

user.PersonId = personInfo.PersonId;

user.WCToken = token;

user.PersonInfoObject = personInfo.GetXml();

}

// save the record

context.SaveChanges();

}

### Updating the database

We will need to update our database in Sql Azure and running the following query will add the appropriate table

CREATE TABLE [dbo].[HealthVaultUsers]

(

[Id] INT NOT NULL PRIMARY KEY IDENTITY,

[Name] NVARCHAR(MAX) NOT NULL,

[PersonId] UNIQUEIDENTIFIER NOT NULL,

[RecordId] UNIQUEIDENTIFIER NOT NULL,

[PersonInfoObject] NVARCHAR(MAX) NOT NULL,

[WCToken] NVARCHAR(MAX) NOT NULL,

[HealthRecordState] NVARCHAR(50) NOT NULL

)

Once you have added the table, compile and run the project. Attempt to sign in and a record will be created in the table.

Note, when saving the WCToken, you should encrypt this value somehow. In production, I would not keep this token in a database unencrypted.

## Building Services

Now that we have our main MVC App updated, we can build out the APIs to return the appropriate data. The next few sections will cover building these services up.

### Sending List of Users

First method we want to create in our API is a method to send back all the users registered in the system. Open up **Areas\v1\Controllers\DoctorAccountController.cs** and add the following method

/// <summary>

/// Gets a list of users in the system

/// </summary>

/// <returns></returns>

[AuthorizeRole(Roles="Doctor")]

public ActionResult GetUserList()

{

var ret = new { status = "ok" };

// get a list of users

var context = new HVDbContext();

var users = (from t in context.HealthVaultUsers

select new

{

t.Id,

t.RecordId,

t.Name,

}).ToList();

// compose the response

return Json(new

{

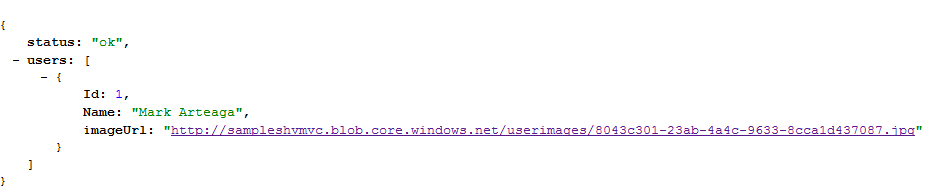
status = ret.status,

users = users.Select(a => new { a.Id, a.Name, imageUrl = HVUserImageHelper.Default.GetImageUrl(a.RecordId) }).ToList(),

}, JsonRequestBehavior.AllowGet);

}

Run the application, navigate to <http://localhost/v1/doctoraccount/getuserlist> and you should get the following



### Sending User Data

Now that we can get a list of users, we can go ahead and create our method to return data about the user. Add the following method to the **DoctorAccountController.cs**

[HandleError]

public ActionResult GetUserData(int userId = -1)

{

// just do a basic check

if (userId == -1)

return Json(new { status = "error", msg = "userId not sent" }, JsonRequestBehavior.AllowGet);

// try to find the user

var context = new HVDbContext();

var user = (from t in context.HealthVaultUsers

where t.Id == userId

select t).FirstOrDefault();

// if no user is found return error

if (user == null)

return Json(new { status = "error", msg = "userId not found" }, JsonRequestBehavior.AllowGet);

// extract the token and make the request to health vault for all the data

var authToken = user.WCToken;

// register the type in the HV SDK

ItemTypeManager.RegisterTypeHandler(HVJournalEntry.TypeId, typeof(HVJournalEntry), true);

// create the appropriate objects for health vault

var appId = HealthApplicationConfiguration.Current.ApplicationId;

WebApplicationCredential cred = new WebApplicationCredential(

appId,

authToken,

HealthApplicationConfiguration.Current.ApplicationCertificate);

// setup the user

WebApplicationConnection connection = new WebApplicationConnection(appId, cred);

PersonInfo personInfo = null;

try

{

personInfo = HealthVaultPlatform.GetPersonInfo(connection);

}

catch

{

return Json(new { status = "error", msg = "Unable to connect to HealthVault service" }, JsonRequestBehavior.AllowGet);

}

// get the selected record

var authRecord = personInfo.SelectedRecord;

// make sure there is a record returned

if (authRecord == null)

return Json(new { status = "error", msg = "cannot get selected record" }, JsonRequestBehavior.AllowGet);

// before we add make sure we still have permission to read

var result = authRecord.QueryPermissionsByTypes(new List<Guid>() { HVJournalEntry.TypeId }).FirstOrDefault();

if (!result.Value.OnlineAccessPermissions.HasFlag(HealthRecordItemPermissions.Read))

return Json(new { status = "error", msg = "unable to create record as no permission is given from health vault" }, JsonRequestBehavior.AllowGet);

// search hv for the records

HealthRecordSearcher searcher = authRecord.CreateSearcher();

HealthRecordFilter filter = new HealthRecordFilter(HVJournalEntry.TypeId);

searcher.Filters.Add(filter);

HealthRecordItemCollection entries = searcher.GetMatchingItems()[0];

var ret = entries.Cast<HVJournalEntry>().ToList().Select(t => t.JournalEntry);

return Json(ret, JsonRequestBehavior.AllowGet);

}

Run the application, navigate to <http://localhost/v1/doctoraccount/getuserdata?userid=1> and you should get the following if you have submitted data



## Signing out Users

For completeness, we will want user to have the ability to sign out so add the following method in your **DoctorAccountController.cs**

/// <summary>

/// Signs out the currently signed in user

/// </summary>

/// <returns></returns>

public ActionResult SignOut()

{

FormsAuthentication.SignOut();

return Json(new { status = "ok" }, JsonRequestBehavior.AllowGet);

}

## Accessing Services from Win8

Now that our services are ready, we can go ahead and update our WinJS app to retrieve this data after a user has logged in. Our app will be very simple and just display a list of users, and when a user is clicked, show the data for that user.

### Updating LoginManager

To support our new features, we will need to add some extra functionality to our app, primarily in the signing in and out process.

1. In your loginManager.js file, add the following two lines which will be method handlers for when signout is successful or fails

// method to call when signout occurs

onSignOut: null,

// method to call if signout fails for some reason

onSignOutFailed: null,

1. Next add the following function which will essentially call our **SignOut** method in our **DOctorAccountController**

// signs out the current session

signOut: function () {

// make a request

WinJS.xhr({

url: this.\_baseUrl + 'SignOut',

}).then(

function (result) {

if (result.status === 200) {

// we are good see if the status code is ok

var res = JSON.parse(result.responseText);

if (res.status === 'ok') {

// we are ok so callback

if (self.onSignOut)

self.onSignOut(result);

}

else {

// tell the user we can't signout

if (self.onSignOutFailed)

self.onSignOutFailed(result);

}

}

else {

// there was a wrong reposne from server

if (self.onSignOutFailed)

self.onSignOutFailed(result);

}

},

function (result) {

// there was an error so report back to user

if (self.onSignOutFailed)

self.onSignOutFailed(result);

});

}

### Getting List of Users and Data

When the user is signed in, we want to show a list of users that have registered with the system. To facilitate accessing data, we will create a new file called **hvData.js** to access all data from the server.

In the **js** folder create a new javascript file called **hvData.js** and implement it as follows

(function () {

"use strict";

var self;

WinJS.Namespace.define("Application", {

HealthVaultData: WinJS.Class.define(

function HealthVaultData() {

// save a ref

self = this;

// store this object globally

Application.healthVaultData = this;

},

{

\_baseUrl: 'http://localhost:10190/api/v1/DoctorAccount/',

// Gets a list of users in the system

getUsers: function (success, fail) {

WinJS.xhr({

url: this.\_baseUrl + 'getuserlist'

}).then(

function (result) {

try {

var res = JSON.parse(result.responseText);

if (res.status === 'ok') {

// we are ok

if (success)

success(res.users);

}

else {

// we are not user id must not exist

if (fail)

fail(result);

}

}

catch (e) {

// just assume there is no cookie saved

if (fail)

fail()

}

},

function (result) {

// there was an error so let the caller know

if (fail)

fail(result);

});

},

// Gets a list of a users entries

getUserEntries: function (userId, success, fail) {

WinJS.xhr({

url: this.\_baseUrl + 'getuserdata?userId=' + userId

}).then(

function (result) {

try {

var res = JSON.parse(result.responseText);

if (res.status === 'ok') {

// we are ok

if (success)

success(res);

}

else {

// we are not user id must not exist

if (fail)

fail(result);

}

}

catch (e) {

// just assume there is no cookie saved

if (fail)

fail()

}

},

function (result) {

// there was an error so let the caller know

if (fail)

fail(result);

});

},

}

)

});

})();

This will essentially call the server and retrieve user data or a user list and return to the caller.

Open up **default.html** and add a reference to this new file as follows

<script src="/js/hvData.js"></script>

## Updating our UI

We will be showing the list of users in a ListView and databinding to that view. We will not go in detail on this but if you want more information see [QuickStart: Adding a ListView (Metro style apps using Javascript and HTML)](http://msdn.microsoft.com/en-us/library/windows/apps/hh465496.aspx). First we will need to update our **home.html** to add the extra sign in/out functionality we added in the previous section

1. Open up **home.html** and add the following in the section tag

<button>Sign In</button>  
<div id="userList" data-win-control="WinJS.UI.ListView"></div>

1. Open **home.js** and replace the **ready function** with the following implementation. This new implementation basically adds functionality to change the UI depending on if the user is signed in or not.

var self = this;

hvData = new Application.HealthVaultData();

// handle the on sign out method

Application.loginManager.onSignOut = function () {

self.status.innerText = "need to sign in";

self.btnSignOut.innerText = "Sign In";

userList.winControl.itemDataSource = new WinJS.Binding.List([]).dataSource;

}

// handle not being able to sign out

Application.loginManager.onSignOutFailed = function () {

// show a message to user and ask if they want to try again

var msg = new Windows.UI.Popups.MessageDialog("Unable to sign out.");

msg.commands.append(new Windows.UI.Popups.UICommand("Try again", function (command) {

Application.loginManager.signOut();

}));

msg.commands.append(new Windows.UI.Popups.UICommand("Close"));

msg.defaultCommandIndex = 0;

msg.cancelCommandIndex = 1;

msg.showAsync();

}

// wire up the completed events

Application.loginManager.onLoginComplete = function (result) {

// we are good so attempt to get data

console.log('sign in successful');

self.status.innerText = "sign in successful";

self.btnSignOut.innerText = "Sign Out";

self.bindUsers();

};

// wire up the failed event

Application.loginManager.onLoginFailed = function (result) {

// show a message to user and ask if they want to try again

var msg = new Windows.UI.Popups.MessageDialog("Unable to sign in.");

msg.commands.append(new Windows.UI.Popups.UICommand("Try again", function (command) {

self.showSettings();

}));

msg.commands.append(new Windows.UI.Popups.UICommand("Close"));

msg.defaultCommandIndex = 0;

msg.cancelCommandIndex = 1;

msg.showAsync();

};

// attempt to make the request

Application.loginManager.ping(function () {

// we are good

self.status.innerText = "already logged in and cookie set";

self.btnSignOut.innerText = "Sign Out";

self.bindUsers();

},

function (result) {

self.status.innerText = "need to sign in";

self.btnSignOut.innerText = "Sign In";

self.showSettings();

});

// wire up the sign out button

self.btnSignOut.addEventListener('click', function () {

if (this.innerText === "Sign In")

self.showSettings();

else

Application.loginManager.signOut();

});

1. Change the **showSettings** method implementation to the following since our log in/out handlers are moved to the ready function

WinJS.UI.SettingsFlyout.showSettings("login", "/pages/login/login.html");

1. Now add the following helper functions to get elements in the page

status: {

get:function(){ return document.querySelector('section[role=main] p');}

},

btnSignOut: {

get: function () { return document.querySelector('section[role=main] button'); }

}

1. Add the following function which will call hvdata.js to get a list of users

// binds the list to the listview

bindUsers: function () {

var self = this;

hvData.getUsers(function (users) {

// we are good so bind

userList.winControl.itemDataSource = new WinJS.Binding.List(users).dataSource;

},

function () {

// something went wrongshow a message to user and ask if they want to try again

var msg = new Windows.UI.Popups.MessageDialog("Unable to get user list.");

msg.commands.append(new Windows.UI.Popups.UICommand("Try again", function (command) {

WinJS.Promise.timeout(300).then(function () {

self.bindUsers();

});

}));

msg.commands.append(new Windows.UI.Popups.UICommand("Close"));

msg.defaultCommandIndex = 0;

msg.cancelCommandIndex = 1;

msg.showAsync();

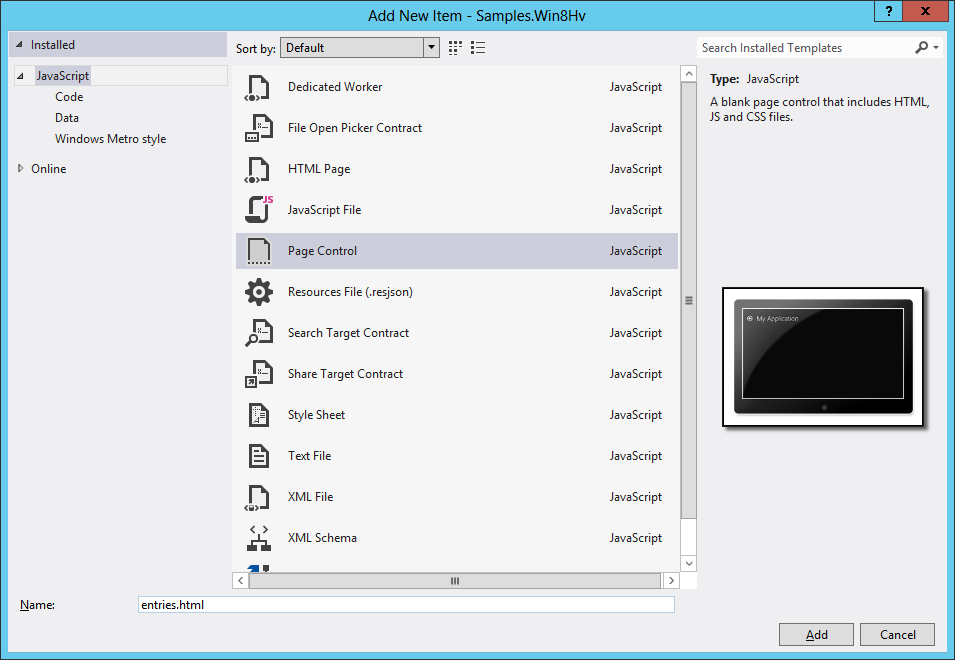
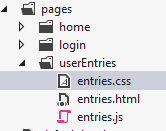
});

},

Compile and run the app. If you have not signed in before, you will be shown the login flyout. If you have you will be shown a sign out button. If you have signed in before and your cookie is still active, you will be shown the sign out button. At the appropriate times, the list will be bound to what is returned from the services.

### Showing User Entries

Now that we have a list of users displayed when selected we want to go ahead and display the entries for that user.

1. Right click on **pages** and click **Add -> New Folder**
2. Name the folder **userEntries**
3. Right click on the new folder and click **Add -> New Item**
4. In the **Add New Item** dialog box select **Page Control** and name it **entries.html**
5. Your folder structure should look like the following   
   

Now that we have our structure for showing entries, we need a way to navigate to the page. Open **home.js**  and add the following in the **ready** function

// wire up the item invoked event

userList.addEventListener('iteminvoked', function (e) {

var elem = document.getElementById("contenthost");

// get the item that is selected

var item = userList.winControl.itemDataSource.list.getItem(e.detail.itemIndex).data;

// set the item globally so we can grab from entries page

Application.selectedUser= item;

// exit the content and when done navigate and enter the content

WinJS.UI.Animation.exitContent(elem, null).then(function () {

// now navigate

WinJS.Navigation.navigate("/pages/userEntries/entries.html").then(function () {

WinJS.UI.Animation.enterPage(elem, null);

});

});

});

Open up **entries.html** and replace the section child node with the following to add ListView

<div id="entries" data-win-control="WinJS.UI.ListView">

Open **entries.js** and add the following function

// gets the user data from the system

getUserData: function(){

Application.healthVaultData.getUserEntries(Application.selectedUser.Id, function (data) {

// we are good

entries.winControl.itemDataSource = new WinJS.Binding.List(data).dataSource;

},

function () {

// something went wrongshow a message to user and ask if they want to try again

var msg = new Windows.UI.Popups.MessageDialog("Unable to get user data.");

msg.commands.append(new Windows.UI.Popups.UICommand("Try again", function (command) {

WinJS.Promise.timeout(300).then(function () {

self.getUserData();

});

}));

msg.commands.append(new Windows.UI.Popups.UICommand("Close"));

msg.defaultCommandIndex = 0;

msg.cancelCommandIndex = 1;

msg.showAsync();

});

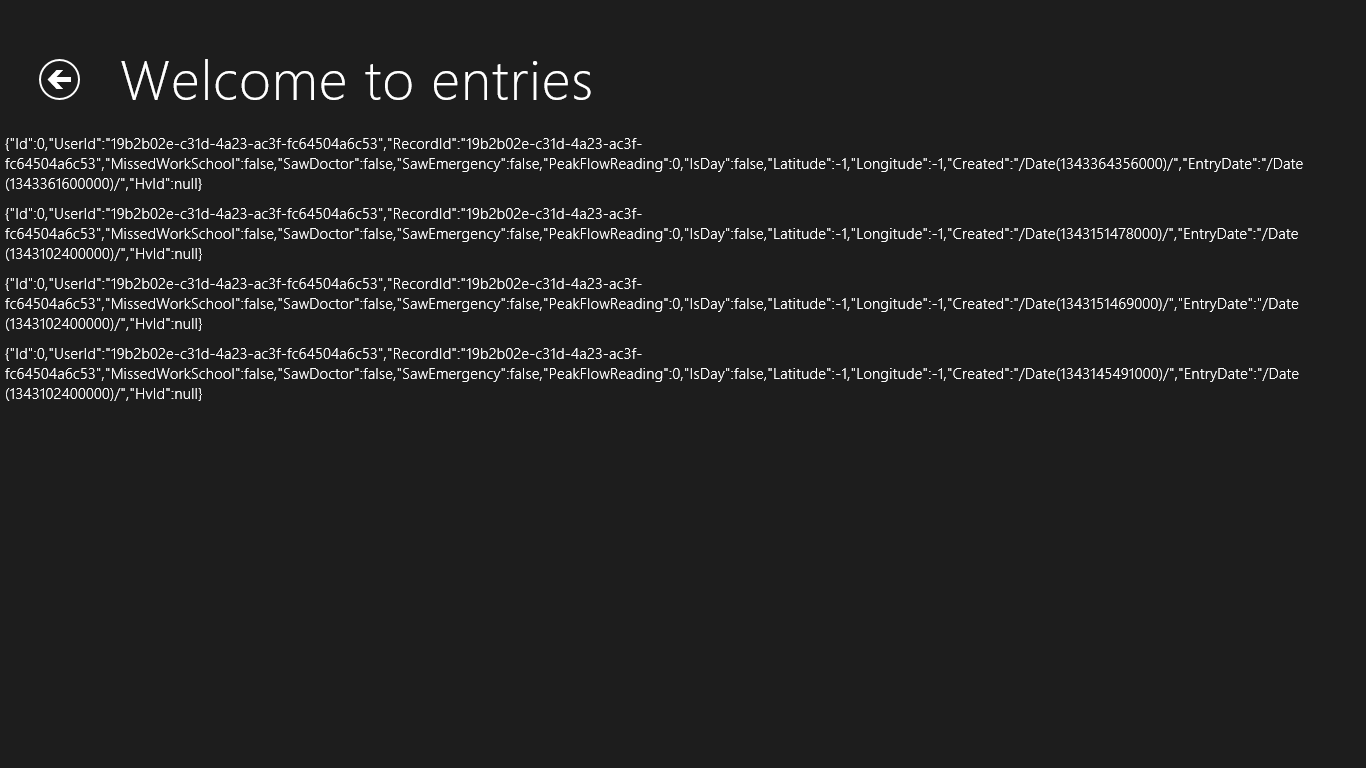
},

In the **ready** function, add the following to call the newly created method

this.getUserData();

Compile and run the project. When you have successfully signed in, you will get a list of users in the system, 

And when you click on a user entry, it will navigate you to the entries page and show the entries associated with that user.



## Final Cleanup

We have gone through and successfully retrieved data from the HealthVault server and displayed within an HealthVault app. A few things that are still required that I will leave up to the user to implement are

1. Progress on login/logout – show a progress bar when the user is logging in or out
2. Progress on getting data – show a progress when we are grabbing data from our server to display
3. Styling of data – need to style the user information as well as the entries for the user

## Conclusion

In this second part of this article, we looked at updating our MVC application to save HealthVault user information to allow us to access data while the user is not logged in. We also updated the services to return user information and data associated with that user. And finally, we updated the Win8 WinJS application to display users and data for selected users.