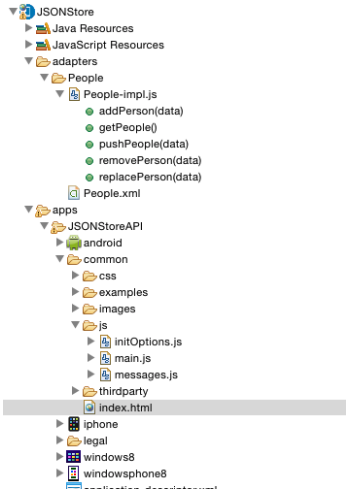
JSONStore – JavaScript API

This tutorial covers the following topics



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What is JSONStore?

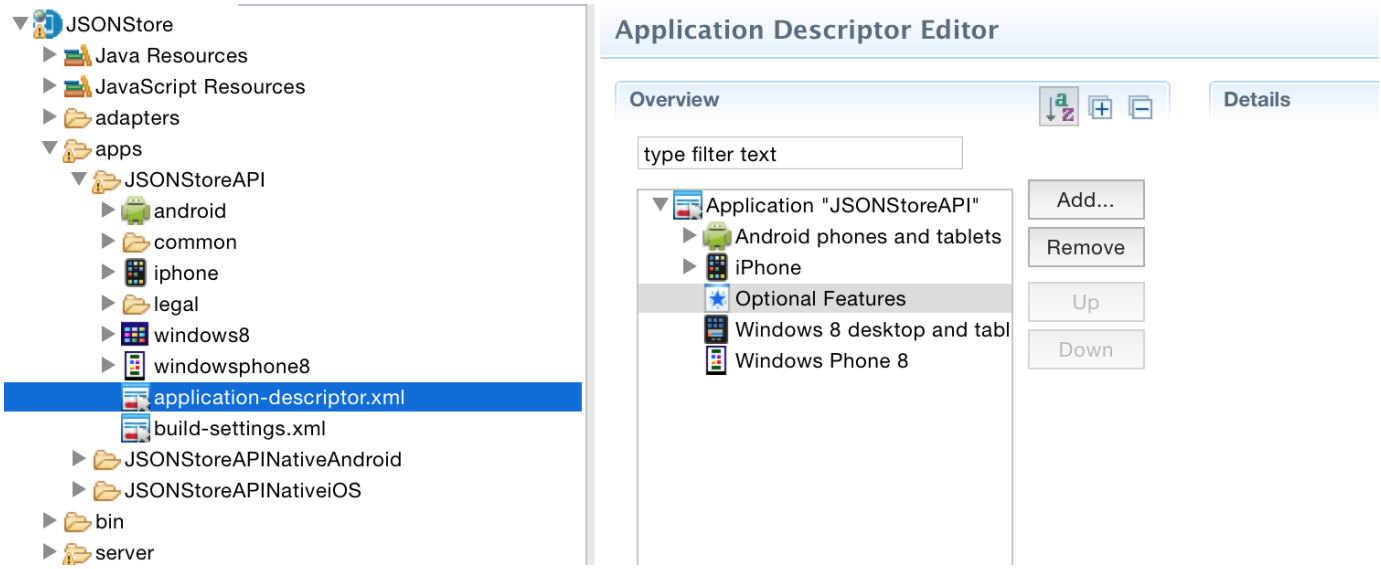
JSONStore is a lightweight, document-oriented storage system that is included as a feature of IBM® MobileFirst Platform Foundation, and enables persistent storage of JSON documents. Documents in an application are available in JSONStore even when the device that is running the application is offline. This persistent, always-available storage can be useful to access documents when, for example, there is no network connection to the device.

Add JSONStore Feature

To add JSONStore to your hybrid environment open the `application-descriptor.xml` simply add `` under the `` element.

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<application xmlns="http://www.worklight.com/application-descriptor" id="JSONStoreAPI" platformVersion
="7.0.0.00.20150312-0731">
   <displayName>JSONStoreAPI</displayName>
   <description>JSONStoreAPI</description>
   <author>
      <name>application's author</name>
      <email>application author's e-mail</email>
      <homepage>http://mycompany.com</homepage>
      <copyright>Copyright My Company</copyright>
   </author>
   <mainFile>index.html</mainFile>
   <features>
      <JSONStore/>
   </features>
   <thumbnailImage>common/images/thumbnail.png</thumbnailImage>
   <iphone bundleId="com.JSONStoreAPI" version="1.0">
      <worklightSettings include="false"/>
      <security>
         <encryptWebResources enabled="false"/>
         <testWebResourcesChecksum enabled="false" ignoreFileExtensions="png, jpg, jpeg, gif, mp4,
mp3"/>
      </security>
   </iphone>
   <android version="1.0">
      <worklightSettings include="false"/>
      <security>
         <encryptWebResources enabled="false"/>
         <testWebResourcesChecksum enabled="false" ignoreFileExtensions="png, jpg, jpeg, gif, mp4,
mp3"/>
         <publicSigningKey>Replace this text with the actual public signing key of the certificate used to s
ign the APK, available by using the 'Extract public signing key' wizard.</publicSigningKey>
         <packageName>Replace this text with the actual package name of the application, which is the v
alue of the 'package' attribute in the 'manifest' element in AndroidManifest.xml file.</packageName>
      </security>
   </android>
   <windowsPhone8 version="1.0">
      <uuid>e5eeea5c-4c80-40d4-b250-c8f2e8698138</uuid>
   </windowsPhone8>
   <windows8 version="1.0">
      <uuid>802f8287-a3f7-4dc5-ac17-0da638074763</uuid>
   </windows8>
</application>
```

Alternatively, you can use the **Application Descriptor Editor** click **Optional Features > Add > JSONStore > OK**


JSONStore
Java Resources
JavaScript Resources
adapters
apps
JSONStoreAPI
android
common
iphone
legal
windows8
windowsphone8
application-descriptor.xml
build-settings.xml
JSONStoreAPINativeAndroid
JSONStoreAPINativeiOS
bin
server
Application Descriptor Editor
Overview
Details
type filter text
Application "JSONStoreAPI"
Android phones and tablets
iPhone
Optional Features
Windows 8 desktop and tabl
Windows Phone 8
Add...
Remove
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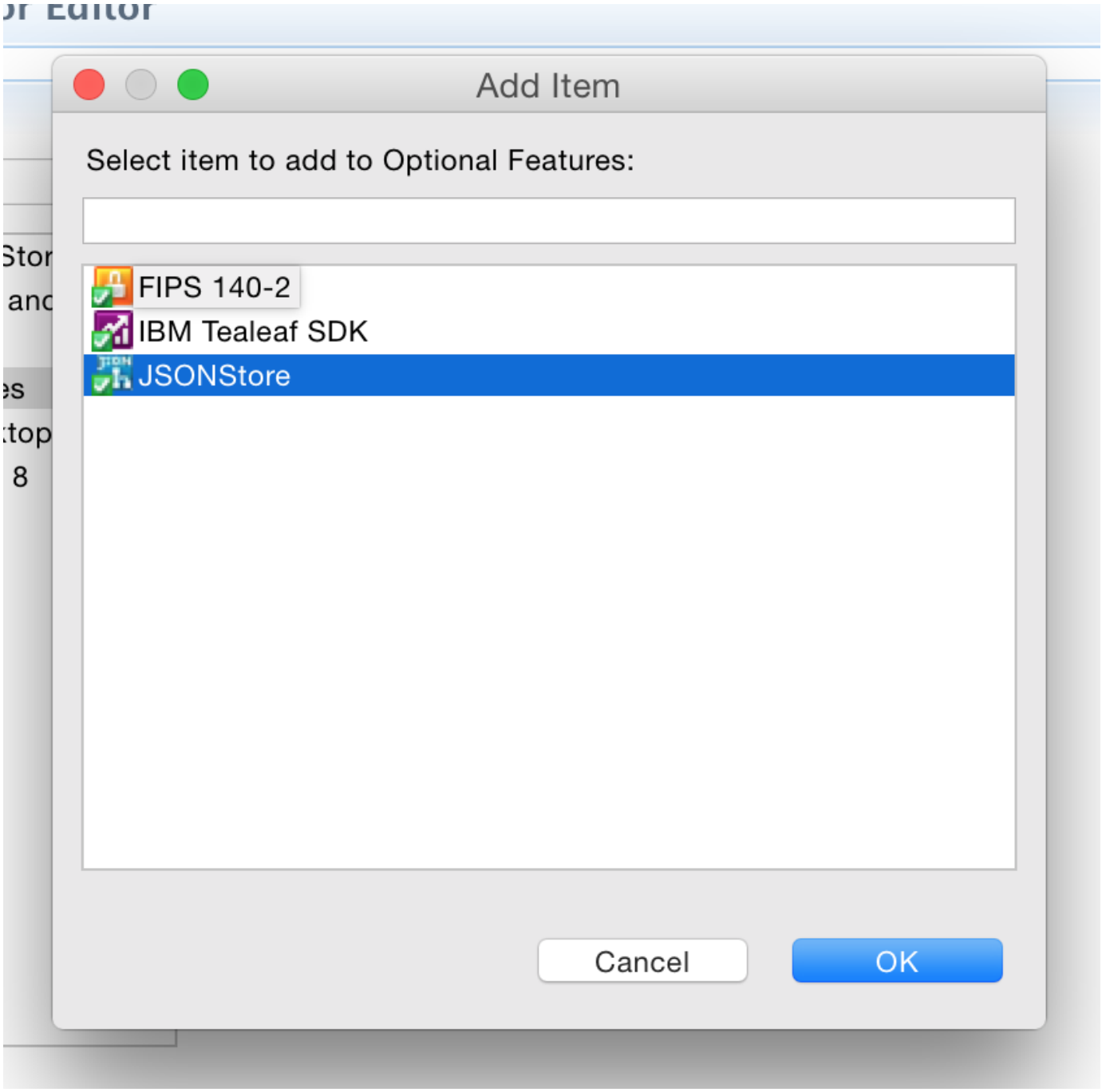
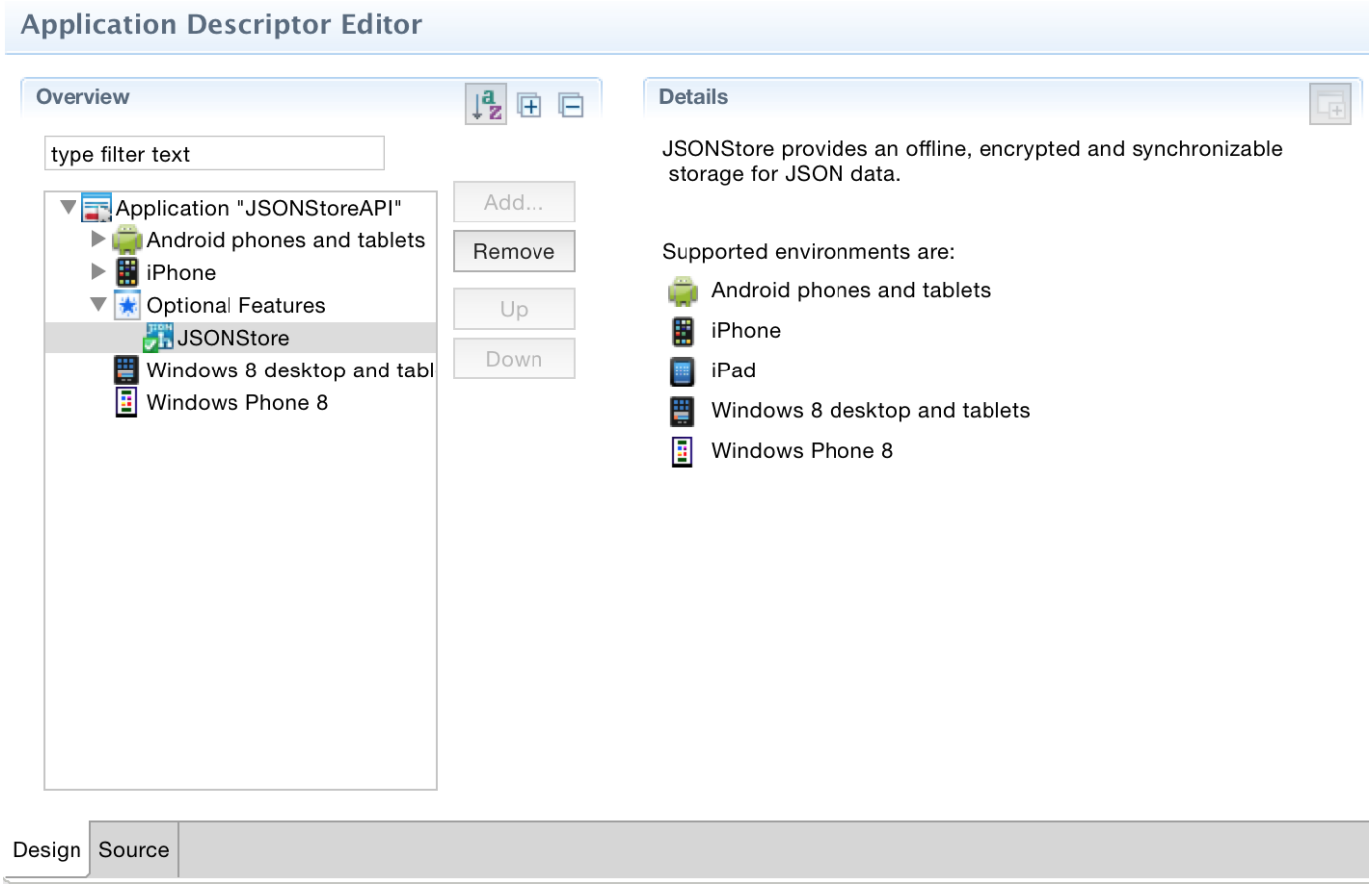
Down


Add Item
Select item to add to Optional Features:
FIPS 140-2
IBM Tealeaf SDK
JSONStore
Cancel
OK



Initialize

Use `init` to start one or more JSONStore collections

Starting or provisioning a collections means creating the persistent storage that contains the collection and documents, if it does not exists.

If the persistent storage is encrypted and a correct password is passed, the necessary security procedures to make the data accessible are run.

For optional features that you can enable at initialization time, see **Security, Multiple User Support,** and **MobileFirst Adapter Integration** in the second part of this module

```
var collections = {
  people : {
    searchFields: {name: 'string', age: 'integer'}
  }
};

WL.JSONStore.init(collections).then(function (collections) {
  // handle success - collection.people (people's collection)
}).fail(function (error) {
  // handle failure
});
```

Get

Use `get` to create an accessor to the collection. You must call `init` before you call get otherwise the result of get is undefined

```
var collectionName = 'people';
var people = WL.JSONStore.get(collectionName);
```

The variable `people` can now be used to perform operations on the `people` collection such as `add`, `find`, and `replace`

Add

Use `add` to store data as documents inside a collection

```
var collectionName = 'people';
var options = {};
var data = {name: 'yoel', age: 23};

WL.JSONStore.get(collectionName).add(data, options).then(function () {
 // handle success
}).fail(function (error) {
 // handle failure
});
```

Find

Use `find` to locate a document inside a collection by using a query. Use `findAll` to retrieve all the documents inside a collection. Use `findById` to search by the document unique identifier. The default behavior for find is to do a "fuzzy" search

```
<p>var query = {name: 'yoel'};
<p>var collectionName = 'people';
<p>var options = {
  exact: false, //default
  limit: 10 // returns a maximum of 10 documents, default: return every document
};

WL.JSONStore.get(collectionName).find(query, options).then(function (results) {
  // handle success - results (array of documents found)
}).fail(function (error) {
  // handle failure
});
```

Replace

Use `replace` to modify documents inside a collection. The field that you use to perform the replacement is `_id,` the document unique identifier.

```
var document = {
  _id: 1, json: {name: 'chevy', age: 23}
};
var collectionName = 'people';
var options = {};
WL.JSONStore.get(collectionName).replace(document, options).then(function (numberOfDocsReplaced)
{
  // handle success
}).fail(function (error) {
  // handle failure
});
```

This examples assumes that the document `{_id: 1, json: {name: 'yoel', age: 23} }` is in the collection

Remove

Use `remove` to delete a document from a collection

Documents are not erased from the collection until you call push. For more information, see the **MobileFirst Adapter Integration** section later in this tutorial

```
var query = {_id: 1};
var collectionName = 'people';
var options = {exact: true};
WL.JSONStore.get(collectionName).remove(query, options).then(function (numberOfDocsRemoved) {
  // handle success
}).fail(function (error) {
  // handle failure
});
```

Remove Collection

Use `removeCollection` to delete all the documents that are stored inside a collection. This operation is similar to dropping a table in database terms

```
var collectionName = 'people';
WL.JSONStore.get(collectionName).removeCollection().then(function (removeCollectionReturnCode) {
  // handle success
}).fail(function (error) {
  // handle failure
});
```

Destroy

Use `destroy` to remove the following data:

- All documents
- All collections
- All Stores (See "**Multiple User Support**" later in this tutorial)

- All JSONStore metadata and security artifacts See "**Security**" later in this tutorial

```
var collectionName = 'people';
WL.JSONStore.destroy().then(function () {
  // handle success
}).fail(function (error) {
  // handle failure
});
```

Security

You can secure all the collections in a store by passing a password to the `init` function. If no password is passed, the documents of all the collections in the store are not encrypted.

Data encryption is only available on Android, iOS, Windows Phone 8, and Windows 8 environments.

Some security metadata are stored in the keychain (iOS), shared preferences (Android), isolated storage (Windows 8 Phone), or the credential locker (Windows 8).

The store is encrypted with a 256-bit Advanced Encryption Standard (AES) key. All keys are strengthened with Password-Based Key Derivation Function 2 (PBKDF2).

Use `closeAll` to lock access to all the collections until you call `init` again. If you think of `init` as a login function you can think of `closeAll` as the corresponding logout function.

Use `changePassword` to change the password.

```
var collections = {
  people: {
    searchFields: {name: 'string'}
  }
};

var options = {password: '123'};
WL.JSONStore.init(collections, options).then(function () {
  // handle success
}).fail(function (error) {
  // handle failure
});
```

Multiple User Support

You can create multiple stores that contain different collections in a single MobileFirst application. The `init` function can take an options object with a username. If no username is given, the default username is **jsonstore**

```
var collections = {
  people: {
    searchFields: {name: 'string'}
  }
};

var options = {username: 'yoel'};
WL.JSONStore.init(collections, options).then(function () {
  // handle success
}).fail(function (error) {
  // handle failure
});
```

MobileFirst Adapter Integration

This section assumes that you are familiar with MobileFirst adapters. MobileFirst Adapter Integration is optional and provides ways to send data from a collection to an adapter and get data from an adapter into a collection.

You can achieve these goals by using functions such as `WL.Client.invokeProcedure` or `jQuery.ajax` if you need more flexibility.

Adapter Implementation

Create a MobileFirst adapter and name it "**People**". Define it's procedures `addPerson`, `getPeople`, `pushPeople`, `removePerson`, and `replacePerson`.

```
function getPeople() {
 var data = { peopleList : [{name: 'chevy', age: 23}, {name: 'yoel', age: 23}] };
 WL.Logger.debug('Adapter: people, procedure: getPeople called.');
 WL.Logger.debug('Sending data: ' + JSON.stringify(data));
 return data;
}

function pushPeople(data) {
 WL.Logger.debug('Adapter: people, procedure: pushPeople called.');
 WL.Logger.debug('Got data from JSONStore to ADD: ' + data);</p>
 return;
}
function addPerson(data) {
 WL.Logger.debug('Adapter: people, procedure: addPerson called.');
 WL.Logger.debug('Got data from JSONStore to ADD: ' + data);</p>
 return;
}
function removePerson(data) {
 WL.Logger.debug('Adapter: people, procedure: removePerson called.');
 WL.Logger.debug('Got data from JSONStore to REMOVE: ' + data);</p>
 return;
}
function replacePerson(data) {
 WL.Logger.debug('Adapter: people, procedure: replacePerson called.');
 WL.Logger.debug('Got data from JSONStore to REPLACE: ' + data);</p>
 return;
}
```

Initialize a collection linked to a MobileFirst adapter

```
var collections = {
  people : {
    searchFields : {name: 'string', age: 'integer'},
    adapter : {
      name: 'People',
      add: 'addPerson',
    remove: 'removePerson',
    replace: 'replacePerson',
    load: {
        procedure: 'getPeople',
      params: [],
      key: 'peopleList'
    }
   }
  }
}

var options = {};
WL.JSONStore.init(collections, options).then(function () {
  // handle success
}).fail(function (error) {
  // handle failure
});
```

Load data from MobileFirst Adapter

When `load` is called, JSONStore uses some metadata about the adapter (**name** and **procedure**), which you previously passed to `init`, to determine what data to get from the adapter and eventually store it.

```
var collectionName = 'people';
WL.JSONStore.get(collectionName).load().then(function (loadedDocuments) {
  // handle success
}).fail(function (error) {
  // handle failure
});
```

Get Push Required (Dirty Documents)

Calling `getPushRequired` returns and array of so called "dirty documents", which are documents that have local modifications that do not exist on the back-end system. These documents are sent to the MobileFirst adapter when `push` is called.

```
var collectionName = 'people';
WL.JSONStore.get(collectionName).getPushRequired().then(function (dirtyDocuments) {
  // handle success
}).fail(function (error) {
  // handle failure
});
```

To prevent JSONStore from marking the documents as "dirty", pass the option `{markDirty:false}` to `add`, `replace`, and `remove`

Push

`push` sends the documents that changed to the correct MobileFirst adapter procedure (i.e., `addPerson` is called with a document that was added locally). This mechanism is based on the last operation that is associated with the document that changed and the adapter metadata that is passed to `init`.

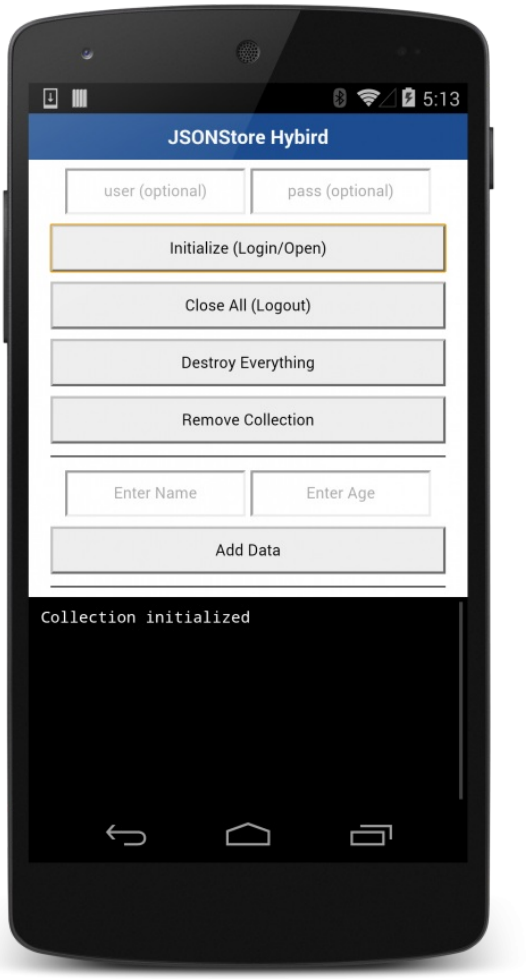
```
var collectionName = 'people';
WL.JSONStore.get(collectionName).push().then(function (response) {
  // handle success
  // response is an empty array if all documents reached the server
  // response is an array of error responses if some documents failed to reach the server
}).fail(function (error) {
  // handle failure
});
```

Enhance

Use `enhance` to extend the core API to fit your needs, by adding functions to a collection prototype.

This example shows how to use `enhance` to adde the function `getValue` that works on the `keyvalue` collection. It takes a `key` (string) as it's only parameter and returns a single result.

```
var collectionName = 'keyvalue';
WL.JSONStore.get(collectionName).enhance('getValue', function (key) {
  var deferred = $.Deferred();
  var collection = this;
  //Do an exact search for the key
  collection.find({key: key}, {exact:true, limit: 1}).then(deferred.resolve, deferred.reject)
;
  return deferred.promise();
});
//Usage:
var key = 'myKey';
WL.JSONStore.get(collectionName).getValue(key).then(function (result) {
  // handle success
  // result contains an array of documents with the results from the find
}).fail(function () {
  // handle failure
});
```



Sample application

Click to download (http://public.dhe.ibm.com/software/products/en/MobileFirstPlatform/docs/v700/JSONStoreAPIBasicsProject.zip) the Studio project.

The Studio project contains an application that demonstrates the use of JSONStore in a hybrid environment.

For more information

For more information about JSONStore, see the product user documentation.