

# Using JSONStore in Cordova applications

## Overview

This tutorial is a continuation of the JSONStore Overview tutorial.

Pre-requisites: Cordova CLI installed on the developer workstation.

Make sure you have read the Setting up your MobileFirst development environment (../../setting-up-your-development-environment/setting-up-the-mobilefirst-development-environment) tutorial.

The tutorial covers the following topics:

- Add the JSONStore feature
- Basic Usage
  - Initialize
  - Get
  - Add
  - Find
  - Replace
  - Remove
  - Remove Collection
  - Destroy
- Advanced Usage
  - Security
  - Multiple User Support
  - MobileFirst Adapter Integration
  - Enhance
- Sample application

## Add the JSONStore feature

To add JSONStore to your hybrid environment use cordova CLI:

1. Open terminal
2. Navigate to your Cordova project folder.
3. Type the following command: `cordova plugin add cordova-plugin-mfp-jsonstore`

This command will add the jsonstore plugin to your project.

```
$ cordova plugin add cordova-plugin-mfp-jsonstore
Fetching plugin "cordova-plugin-mfp-jsonstore" via npm
Installing "cordova-plugin-mfp-jsonstore" for android
Dependent plugin "cordova-plugin-mfp" already installed on android.
Installing "cordova-plugin-mfp-jsonstore" for ios
Dependent plugin "cordova-plugin-mfp" already installed on ios.
```

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

```
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
});
```

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 tutorial.

## Get

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

```

var query = {name: 'yoel'};
var collectionName = 'people';
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 `WLResourceRequest` or `jQuery.ajax` if you need more flexibility.

## Adapter Implementation

Create a MobileFirst adapter and name it **"People"**.

Define its 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);
    return;
}
function addPerson(data) {
    WL.Logger.debug('Adapter: people, procedure: addPerson called. ');
    WL.Logger.debug('Got data from JSONStore to ADD: ' + data);
    return;
}
function removePerson(data) {
    WL.Logger.debug('Adapter: people, procedure: removePerson called. ');
    WL.Logger.debug('Got data from JSONStore to REMOVE: ' + data);
    return;
}
function replacePerson(data) {
    WL.Logger.debug('Adapter: people, procedure: replacePerson called. ');
    WL.Logger.debug('Got data from JSONStore to REPLACE: ' + data);
    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 an 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 add the function `getValue` that works on the `keyvalue` collection. It takes a `key` (string) as its 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 (<https://github.com/MobileFirst-Platform-Developer-Center/JSONStore>) the MobileFirst project.

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





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