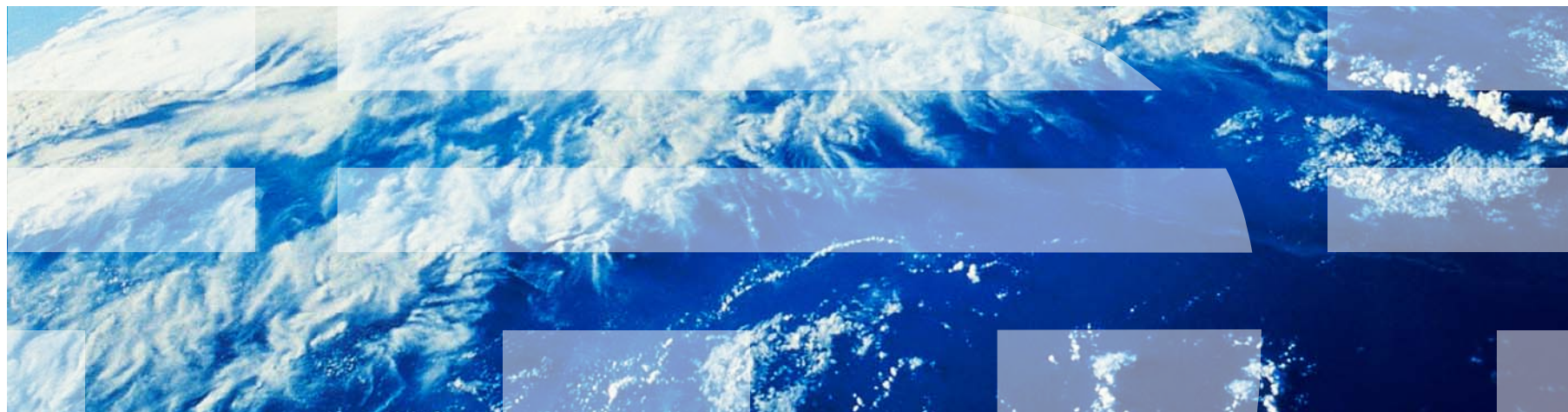


# ***IBM Worklight V6.1.0 Getting Started***

## **JSONStore – Common JSONStore Usage**



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# Introduction

- This module comprises two parts:
  - Basic usage: basic tasks that you can perform on a local JSONStore collection, such as `add` and `find`.
  - Advanced usage: some advanced tasks that, depending on your business requirements for data storage, you might find useful, such as `security`.
- The code samples that are available in this module are short on purpose.
  - Complete examples are available in the sample application that accompanies this module.
  - The screen captures that are used in this module derive from the sample application.

# Agenda

- **Basic Usage**
  - Initialize
  - Get
  - Add
  - Find
  - Replace
  - Remove
  - Remove Collection
  - Destroy
- **Advanced Usage**
  - Security
  - Multiple user support
  - Worklight adapter integration
  - Enhance

## ***Initialize – overview***

- Use `init` to start one or more JSONStore collections.
- Starting or provisioning a collection means creating the persistent storage that contains collections 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.
- For optional features that you can enable at initialization time, see **Security**, **Multiple user support**, and **Worklight adapter integration**, in the second part of this module.

## Initialize – Example

```
var collectionName = 'people';

//Object that defines all the collections
var collections = {};

//Object that defines the 'people' collection
collections[collectionName] = {};

//Object that defines the Search Fields for the 'people' collection
collections[collectionName].searchFields = {name: 'string', age: 'integer'}

WL.JSONStore.init(collections)
.then(function () {
    //handle success
})
.fail(function (errorObject) {
    //handle failure
});
```

Initialize (Login/Open)

## ***Get – Overview***

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

## Get – Example

```
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
  - replace



## ***Add – Overview***

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

## Add – Example

```
var data = {name: 'carlos', age: 99};  
var collectionName = 'people';  
var options = {}; //default  
WL.JSONStore.get(collectionName)  
  .add(data, options)  
  .then(function () {  
    //handle success  
  })  
  .fail(function (errorObject) {  
    //handle failure  
  });
```

## *Find – Overview*

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

# Find – Example

```
var query = {name: 'carlos'};
var collectionName = 'people';
var options = {
  exact: false, //default
  limit: 10 //returns a maximum of 10 documents, default: return every match
};
```

```
WL.JSONStore.get(collectionName)
```

```
.find(query, options)
```

```
.then(function (arrayResults) {
  //arrayResults = [{_id: 1, json: {name: 'carlos', age: 99}}]
})
```

```
.fail(function (errorObject) {
  //handle failure
});
```

Limit (optional)

Offset (optional)

Find By Name (Fuzzy Search)

Find By Age (Exact Search)

Find All

Enter Id

Find (by id)

## *Replace – Overview*

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

## Replace – Example

```
var document = {_id: 1, json: {name:
  'carlitos', age: 99}};
var collectionName = 'people';
var options = {}; //default
```

```
WL.JSONStore.get(collectionName)
```

```
.replace(document, options)
```

```
.then(function () {
  //handle success
})
```

```
.fail(function (errorObject) {
  //handle failure
});
```

- This example assumes that the document `{_id: 1, json: {name: 'carlos', age: 99}}` is in the collection, and shows how to replace it with one where the name is 'carlitos'.

---

Enter Name	Enter Age
Enter Id	Replace (by id)

## ***Remove – Overview***

- 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 **Worklight adapter integration** section, later in this module.

## Remove – Example

```
var query = {_id: 1};
var collectionName = 'people';
var options = {exact: true}; //default: false

WL.JSONStore.get(collectionName)

.remove(query, options)

.then(function () {
    //handle success
})

.fail(function (errorObject) {
    //handle failure
});
```



## ***Remove Collection – Overview***

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

## ***Remove Collection – Example***

```
var collectionName = 'people';

WL.JSONStore.get(collectionName)

.removeCollection()

.then(function () {
    //handle success
})

.fail(function (errorObject) {
    //handle failure
});
```

A rounded rectangular button with a light gray gradient and a thin black border. The text "Remove Collection" is centered in a dark gray font.

Remove Collection

## ***Destroy – Overview***

- Use `destroy` to remove the following data:
  - All documents
  - All collections
  - All stores
    - See **Multiple user support** later in this module.
  - All JSONStore metadata and security artifacts
    - See **Security** later in this module.

## ***Destroy – Example***

```
var collectionName = 'people';

WL.JSONStore.destroy()

.then(function () {
    //handle success
})

.fail(function (errorObject) {
    //handle failure
});
```

Destroy Everything

# Agenda

- Basic Usage
  - Initialize
  - Get
  - Add
  - Find
  - Replace
  - Remove
  - Remove Collection
  - Destroy
- Advanced Usage
  - Security
  - Multiple user support
  - Worklight adapter integration
  - Enhance

# Security – Overview

- 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 and iOS environments.
- Some security metadata are stored:
  - In the Keychain, on iOS
  - In Shared Preferences, on Android
- 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.

# Security – Example

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

var options = {
  password: '123'
};

WL.JSONStore.init(collections, options)

.then(function () {
  //handle success
})

.fail(function (errorObject) {
  //handle failure
});
```

user (optional)	pass (optional)
Initialize (Login/Open)	
Old Password	New Password
user (optional)	Change Password
Close All (Logout)	

## *Multiple user support – Overview*

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



## Multiple user support – Example

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

```
var options = {  
  username: 'carlos'  
};
```

```
WL.JSONStore.init(collections, options)
```

```
.then(function () {  
  //handle success  
})
```

```
.fail(function (errorObject) {  
  //handle failure  
});
```

## ***Worklight adapter integration – Overview***

- This section assumes that you are familiar with Worklight adapters.
- Worklight adapter integration is optional, and provides ways to:
  - Send data from a collection to a Worklight adapter.
  - Get data from a Worklight 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.
- In Worklight Studio, you can use a new wizard to create a template JavaScript™ file.
  - This creation is based on search fields that are selected from the back-end system that you used to communicate with the adapter.

# Adapter implementation – Example

- First, create a Worklight adapter, and define its procedures to get, add, replace, and remove data (such as **getPeople**, **addPerson**, **replacePerson**, and **removePerson**).
- Next, implement these procedures.
  - The following example only returns hard-coded data and logs for simplicity.
  - For more information about how to create a Worklight adapter, see the modules under category 4, *Worklight server-side development*, in the IBM Worklight user documentation, at [http://pic.dhe.ibm.com/infocenter/wrklight/v6r1m0/topic/com.ibm.worklight.getstart.doc/start/c\\_gettingstarted.html](http://pic.dhe.ibm.com/infocenter/wrklight/v6r1m0/topic/com.ibm.worklight.getstart.doc/start/c_gettingstarted.html).

```

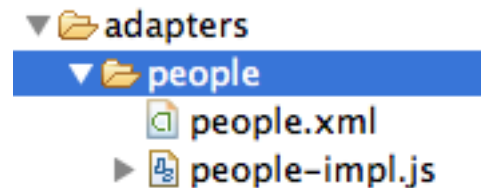
function getPeople () {
  return { peopleList : [{name: 'carlos', age: 100},
    {name: 'tim', age: 99}] };
}

function addPerson (data) {
  return WL.Logger.debug('Got data from
JSONStore to ADD: ' + data);
}

function replacePerson (data) {
  return WL.Logger.debug('Got data from
JSONStore to REPLACE: ' + data);
}

function removePerson (data) {
  return WL.Logger.debug('Got data from
JSONStore to REMOVE: ' + data);
}

```



## Initialize a collection that is linked to a Worklight adapter – Example

- Start the people collection by calling **init** and passing adapter metadata (adapter name, procedure names).
- In the example, the key is *peopleList* because the goal is to store {name: 'carlos', age: 100} and {name: 'tim', age: 99} as two separate documents.

```
var collections = {
  people: {
    searchFields: {
      name: 'string',
      age: 'integer'},
    //-- Start adapter metadata
    adapter : {
      name: 'people',
      add: 'addPerson',
      remove: 'removePerson',
      replace: 'replacePerson',
      load: {
        procedure: 'getPeople',
        params: [],
        key: 'peopleList'
      }
    }
  }
  //-- End adapter metadata
}; // (continued on the right column)
```

*// (continued from the left column)*

```
//Initialize
WL.JSONStore.init(collections)

.then(function () {
  //handle success
})

.fail(function (errorObject) {
  //handle failure
});
```

user (optional)

pass (optional)

Initialize (Login/Open)

## Load data from a Worklight adapter – Example

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

```
WL.JSONStore.get('people').load()  
.then(function () {  
    //handle success  
})  
.fail(function (errorObject) {  
    //handle failure  
});
```



Load Data From Adapter

## Get Push Required – Example

- 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 Worklight adapter when `push` is called.

```
WL.JSONStore.get('people').getPushRequired()  
.then(function () {  
    //handle success  
})  
.fail(function (errorObject) {  
    //handle failure  
});
```

- To stop JSONStore from marking the documents as “dirty”, pass the option `{push: false}` to `add`, `replace`, and `remove`.

Get Push Required

## Push – Example

- `push` sends the document that changed to the correct Worklight adapter procedure (for example: **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`.

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

Push Changes to Adapter

## ***Enhance – Overview***

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



## Enhance – Example

- The example shows how 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.
  - The call to `init` and how to use `enhance` to get a **put** method is shown in the code sample that is associated with this module.

```
//Definition:
var collectionName = 'keyvalue';
WL.JSONStore.get(collectionName).enhance(
  'getValue', function (key) {
    var deferred = $.Deferred(),
        collection = this;

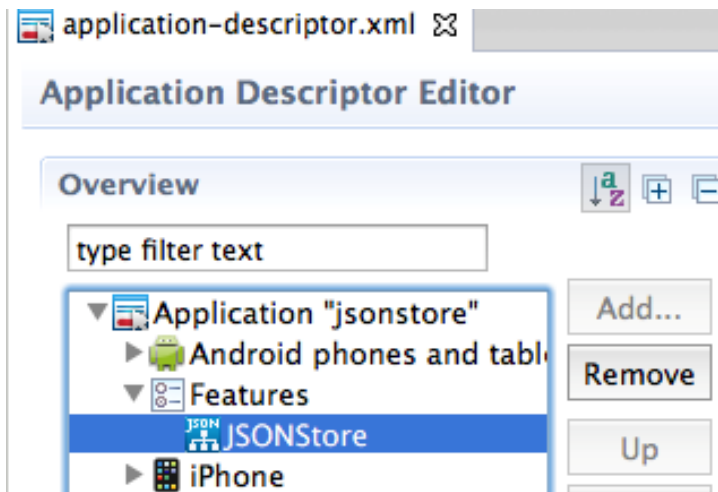
    //Do an exact search for the key
    collection.find({key: key}, {exact:
true, limit: 1})
      .then(deferred.resolve,
deferred.reject);
    return deferred.promise();
  }); // (continued on the right column)
```

```
// (continued from the left column)
//Usage:
var key = 'myKey';
WL.JSONStore.get(collectionName).getValue
  (key)
  .then(function (res) {
    //res contains an array of documents
    //with the results from the find
  })
  .fail(function () {
    //handle failure
  });
```



# Sample

- The sample for this training module can be found in the Getting Started page of the IBM Worklight documentation website at <http://www.ibm.com/mobile-docs>.
- To use the sample for this module, you must install IBM Worklight V6.0.0 Interim Fix (IF) 201307011413 or later.
- Make sure that the application enables the JSONStore feature.



## ***For more information***

- For more information about JSONStore (such as fuzzy search, Worklight Studio wizard, and other topics that are introduced in this module), see the JSONStore documentation in the IBM Worklight user documentation:
- General topics:  
[http://pic.dhe.ibm.com/infocenter/wrklight/v6r1m0/topic/com.ibm.worklight.dev.doc/devref/c\\_jsonstore\\_overview.html](http://pic.dhe.ibm.com/infocenter/wrklight/v6r1m0/topic/com.ibm.worklight.dev.doc/devref/c_jsonstore_overview.html)
- Instance functions:  
<http://pic.dhe.ibm.com/infocenter/wrklight/v6r1m0/topic/com.ibm.worklight.apiref.doc/html/refjavascript-client/html/JSONStoreInstance.html>
- Static functions:  
<http://pic.dhe.ibm.com/infocenter/wrklight/v6r1m0/topic/com.ibm.worklight.apiref.doc/html/refjavascript-client/html/WL.JSONStore.html>

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