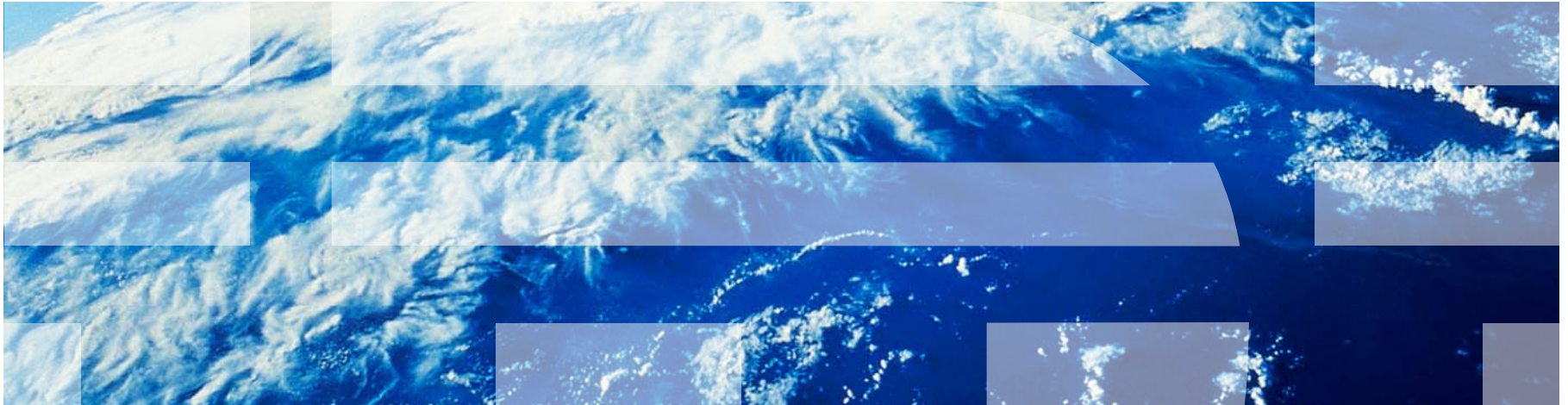


# ***IBM Worklight V6.1.0 Getting Started***

## **JSONStore – The client-side JSON-based database overview**



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# Agenda

- Overview
- JSONStore terms
  - Document
  - Collection
  - Store
  - Search fields and additional Search fields
  - Queries
- Store internals
- Error object

# Introduction

- JSONStore is a JavaScript™ API for storing data inside hybrid IBM Worklight® applications.
- JSONStore is based on JavaScript Object Notation (JSON).
- This module and the following module *JSONStore – Common JSONStore usage* are for you to get started with the JSONStore feature of IBM Worklight JSONStore.

## Features (1 of 2)

- JSONStore is similar to technologies such as:
  - Local web or DOM storage
  - Indexed database API
  - Cordova API: Storage API or File API
  - IBM Worklight Encrypted Cache
- The table on the next slide shows how some features provided by JSONStore compare with other technologies.

## Features (2 of 2)

	JSONStore	Encrypted Cache	Local Storage	Indexed DB	Cordova Storage	Cordova File
Android Support	Yes	Yes	Yes	Yes	Yes	Yes
iOS Support	Yes	Yes	Yes	Yes	Yes	Yes
Web	Dev. Only (3)	Yes	Yes	Yes	-	-
Data Encryption (1)	Yes	Yes	-	-	-	-
Maximum Storage	Available space	~ 5 MB	~ 5 MB	> 5 MB	Available space	Available space
Reliable Storage (2)	Yes	-	-	-	Yes	Yes
Adapter Integration (1)	Yes	-	-	-	-	-
Multi User Support (1)	Yes	-	-	-	-	-
Indexing	Yes	-	-	Yes	Yes	-
Type of Storage	JSON Documents	Key – value pairs	Key – value pairs	JSON Documents	Relational (SQL)	Strings

- > (1): These features are further described in the module *JSONStore – Common JSONStore usage*.
- > (2): *Reliable Storage* means that your data is not deleted unless the application is removed from the device or one of the methods that removes data is called.
- > (3): *Dev. Only* means that it is designed only for development. There are no security features and a ~5 MB storage space limit.

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## ***Note: Relational databases and JSONStore***

- The relational database terminology is used in this module to help define and explain the terminology related to JSONStore.
- However, remember that JSONStore is not a relational database.
  - For example, the way data is structured through schemas when using a relational database differs to the JSONStore approach, where you can store any JSON content, and index what you need to search on.



# Document

- A **document** is a JavaScript object with an automatically generated identifier (*\_id*) and JSON data.
  - It is similar to a *record* or to a *row* in the database terminology.
- Example:

```
var doc = {  
  _id: 1,  
  json: {  
    name: 'carlos',  
    age: 99  
  }  
};
```

# Collection

- A **collection** is a named logical grouping of related documents.
  - It is similar to a *table* in the database terminology.

- Example -- **Customer Collection**

```
[  
  { _id: 1, json: {name: 'carlos', age: 99} },  
  { _id: 2, json: {name: 'tim', age: 100} },  
]
```

# Store

- The **store** is the persistent *file* on the device that holds the contents of one or more collections.
  - It is similar to a *database* in the database terminology.

## ***Search fields and additional search fields (1 of 2)***

- A **search field** is a JavaScript object with a key and a data type.
  - These keys are indexed for fast look-up times.
  - It is like *column fields* or *attributes* in the database terminology.
- **Additional search fields** are keys that are indexed, but are not part of the JSON data that is stored
  - For an example of how to use additional search fields, see the module **JSONStore – Common JSONStore usage** and the associated code sample.

## ***Search fields and additional search fields (2 of 2)***

- These fields define the key whose values (in a given JSON collection) will be indexed, and therefore used to search faster.
- These fields can be of the following data types: `string`, `boolean`, `number` and `integer`.
  - These types determine how indexable fields are stored.
  - For example: defining `{age: 'number'}` indexes 1 as 1.0, while defining `{age: 'integer'}` indexes 1 as 1.
- Examples:

```
var searchField = {name: 'string', age: 'integer'};
```

```
var additionalSearchField = {key: 'string'};
```

# Queries

- Queries are JavaScript objects that use search fields or additional search fields to look for documents.
- The following example presumes that **name** and **age** are search fields, of types **string** and **integer** respectively.

- Examples:

- Find documents with **name** that matches **carlos**:

```
var query1 = {name: 'carlos'};
```

- Find documents with **name** that matches carlos **and** age that matches 99:

```
var query2 = {name: 'carlos', age: 99};
```

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- Error object

## Store internals (1 of 2)

- The following slides give a simplified version of how data is stored.
- In the following example, the key elements are:
  - **\_id** is the unique identifier (example: *AUTO INCREMENT PRIMARY KEY*).
  - **json** contains an exact representation of the stored JSON object.
  - **name** and **age** are search fields.
  - **key** is an additional search field.
  - **people** is the collection name.



## Store internals (2 of 2)

- Example: the **people** table

<code>_id</code>	<code>key</code>	<code>name</code>	<code>age</code>	<code>json</code>
1	c	carlons	99	{name: 'carlos', age: 99}
2	t	tim	100	{name: 'tim', age: 100}

- When you search the **people** table with one or a combination of the following queries, the retrieved document is `{_id: 1, json: {name: 'carlos', age: 99}}` :
  - `{_id : 1}`
  - `{name: 'carlos'}`
  - `{age: 99}`
  - `{key: 'c'}`

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# Error object

- The Error object is a JavaScript object that is returned when a JSONStore operation (such as **find** or **add**) fails.
- The Error object provides information about the cause of the failure.

- **Example**

```
var errorObject = {
  src: 'find', //operation that failed
  err: -50, //error code
  msg: 'PERSISTENT_STORE_FAILURE', //error message
  col: 'people', //collection name
  usr: 'jsonstore', //username
  doc: { _id: 1, {name: 'carlos', age: 99}}, //document that the failure
  relates to
  res: {...} //response from the server
}
```

- Not all the key-value pairs are part of all Error objects.
  - For example, the response from the server is available only when operations that use the network fail, such as **push**.

## ***For more information***

- For more information about the JSONStore API documentation, including JSONStore errors, see the IBM Worklight user documentation.
  - General topics:  
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  - 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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