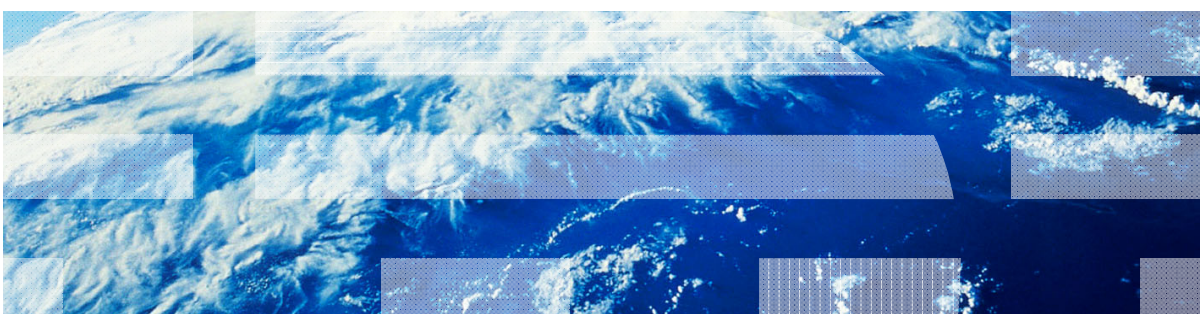
IBM Worklight V5.0.5
Getting Started

Module 7.8 – Encrypted Cache



18 January 2013

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Agenda

- What is encrypted cache?
- Supported browsers and devices
- Create and Open
- Read, Write, and Remove
- Close and Destroy
- Change encryption key
- Exercise

What is encrypted cache?

- Encrypted cache is a mechanism for storing sensitive data on the client side
- Encrypted cache is implemented by using HTML5 web storage technology, which allows data to be saved locally and retrieved on subsequent application use or relaunch
- Data is encrypted with a combination of user-provided key and server-retrieved randomly-generated token, which makes it more secure
- Data is stored using key-value pairs
- Encrypted cache is like a security deposit box – it remains open until you close it, so remember to close the cache when you have finished working with it

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Supported browsers and devices

- Encrypted Cache is implemented using HTML5 web storage technology
- Mobile devices HTML5 web storage support chart

Show all versions	iOS Safari	Opera Mini	Opera Mobile	Android Browser	
3 versions back	3.2				
2 versions back	4.0-4.1		10.0	2.1	
Previous version	4.2-4.3		11.0	2.2	
Current	5.0	5.0-6.0	11.1	2.3	3.0
Near future				4.0	
Farther future					

= Supported = Not supported

- For additional information, see http://caniuse.com

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Creating and opening encrypted cache

- To create or open previously created encrypted cache use the following API:
  - **WL.EncryptedCache.open(credentials, createIfNone, onComplete, onError);**
    - credentials – string value representing user-provided password
    - createIfNone – Boolean value specifying whether new encrypted cache should be created if none is found
    - onComplete – a callback function to be invoked when cache opening/creating is complete
    - onError - a callback function to be invoked when cache is not successfully opened/created.

```
WL.EncryptedCache.open(key, true, onOpenComplete, onOpenError);
function onOpenComplete(status){
    alert("Encrypted cache succesfully opened");
}
```

  - Note that the application must be able to connect to Worklight® server in order to create a new encrypted cache

Creating and opening encrypted cache

- A callback function can receive one of the following statuses:
  - **WL.EncryptedCache.OK** – Encrypted cache was successfully opened or created
  - **WL.EncryptedCache.ERROR_CREDENTIALS_MISMATCH** – an attempt was made to open existing encrypted cache using wrong credentials
  - **WL.EncryptedCache.ERROR_SECURE_RANDOM_GENERATOR_UNAVAILABLE** – unable to generate random token due to Worklight® Server unavailability
  - **WL.EncryptedCache.ERROR_NO_EOC** – could not open encrypted cache because it was not previously created
  - **WL.EncryptedCache.ERROR_LOCAL_STORAGE_NOT_SUPPORTED** – device does not support HTML5 local storage
  - **WL.EncryptedCache.ERROR_KEY_CREATION_IN_PROGRESS** – an open() or changeCredentials() request is already running

Creating and opening encrypted cache

```
WL.EncryptedCache.open(key, true, onOpenComplete, onOpenError);
function onOpenComplete(status){
    alert("Encrypted cache succesfully opened");
}
function onOpenError(status){
    busyIndicator.hide();
    switch(status){
        case WL.EncryptedCache.ERROR_KEY_CREATION_IN_PROGRESS:
            alert("ERROR: KEY CREATION IN PROGRESS");
            break;
        case WL.EncryptedCache.ERROR_LOCAL_STORAGE_NOT_SUPPORTED:
            alert("ERROR: LOCAL STORAGE NOT SUPPORTED");
            break;
        case WL.EncryptedCache.ERROR_NO_EOC:
            alert("ERROR: NO EOC");
            break;
        case WL.EncryptedCache.ERROR_COULD_NOT_GENERATE_KEY:
            alert("ERROR: COULD NOT GENERATE KEY");
            break;
        case WL.EncryptedCache.ERROR_CREDENTIALS_MISMATCH:
            alert("ERROR: CREDENTIALS MISMATCH");
            break;
    }
}
```

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Reading and writing data with encrypted cache

- When the encrypted cache is open, you can perform operations on it such as reading, writing and removing data
- To store data in encrypted cache use the following API:
  - WL.EncryptedCache.write(credentials, value, onSuccess, onFailure);

```
WL.EncryptedCache.write(key, value, onWriteSuccess, onWriteFailure);
function onWriteSuccess(status){
    alert("Succesfully encrypted into cache.");
}
function onWriteFailure(status){
    if (status == WL.EncryptedCache.ERROR_EOC_CLOSED)
        alert("Encrypted cache closed, write failed. error code= "+ status);
}
```

Reading and writing data with encrypted cache

- To read data from the encrypted cache use the following API:
  - WL.EncryptedCache.read(credentials, onSuccess, onFailure);

```
WL.EncryptedCache.read(key, onDecryptReadSuccess, onDecryptReadFailure);
function onDecryptReadSuccess(value){
    alert("Read success. Retrieved value :: " + key + " = " + value);
}
function onDecryptReadFailure(status){
    alert("Encrypted cache closed, reading failed");
}
```

- To remove data from the encrypted cache use the following API:
  - WL.EncryptedCache.remove(key, onSuccess, onFailure);

```
WL.EncryptedCache.remove(key, onRemoveSuccess, onRemoveFailure);
function onRemoveSuccess(status){
    alert("Succesfully removed from cache.");
}
function onRemoveFailure(status){
    alert("Encrypted cache closed, remove failed");
}
```

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Closing and destroying encrypted cache

- To avoid possible undesired access to encrypted cache, close it
- After encrypted cache is closed, access to its data is not possible without the encryption key that was used to create it
- Use the following API to close the encrypted cache
  - WL.EncryptedCache.close(onComplete, onFailure);

```
function closeCacheClicked(){
    WL.EncryptedCache.close(onCloseCompleteHandler, onCloseFailureHandler);
}
function onCloseCompleteHandler(status){
    alert("Encrypted cache closed successfuly");
}
function onCloseFailureHandler(status){
    alert("Could not close Encrypted cache");
}
```

Closing and destroying encrypted cache

- Encrypted cache can be wiped from the local storage
- After encrypted cache is destroyed there is no way to return the data that was stored in it
- Destroy encrypted cache only if you are sure that data stored in it will never be required again, or as a last measure if the encryption key is lost
- To destroy an encrypted cache use the following API:
  - WL.EncryptedCache.destroy(onComplete, onError);

```
function destroyCacheClicked(){
    WL.EncryptedCache.destroy(onDestroyCompleteHandler, onDestroyErrorHandler);
}
function onDestroyCompleteHandler(status){
    alert("Encrypted cache destroyed");
}
function onDestroyErrorHandler(status){
    alert("Error destroying Encrypted cache");
}
```

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Change encryption key

- While encrypted cache is in the open state, it is possible to change the encryption key
- To do so, use the following API:
  - **WL.EncryptedCache.changeCredentials(credentials, onComplete, onError)**
    - **credentials** – new user password to be used.
    - **onComplete** – a callback function to be invoked when complete.
    - **onError** – a callback function to be invoked in case of an error.
- Callback receives a status object with same structure as WL.EncryptedCache.open()

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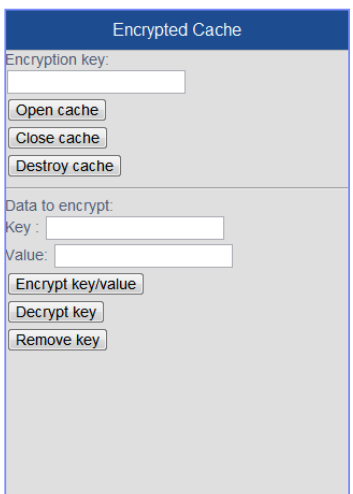
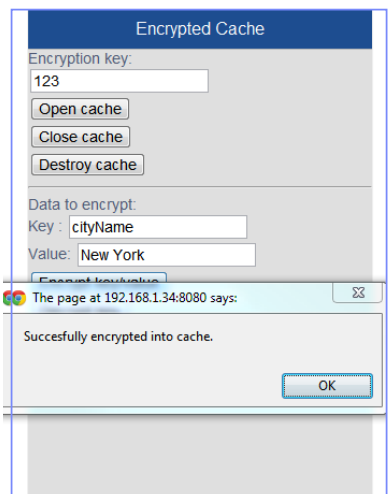
Exercise

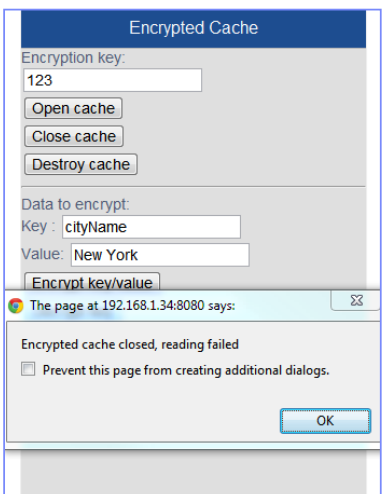
- Create an application that performs the following functions:
  - Creates an encrypted cache with a user-provided encryption key
  - Stores some key-value pair data in it
  - Closes the encrypted cache
  - Tries to access encrypted data while cache is in closed mode
  - Tries to open encrypted cache with an invalid encryption key
  - Opens encrypted cache with the correct encryption key
  - Retrieves previously stored data from encrypted cache
  - Closes encrypted cache
  - Destroys encrypted cache

Exercise

- 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







Check yourself questions

- Connectivity to Worklight server is required only in order to:
  - Create a new encrypted cache
  - Open an existing encrypted cache
  - Read and write values to encrypted cache
  - Destroy encrypted cache
- Which of the following APIs is synchronous and does not require callbacks to be set up?
  - WL.EncryptedCache.open
  - WL.EncryptedCache.read
  - WL.EncryptedCache.destroy
  - All encrypted cache APIs are asynchronous and require setting up callbacks for success and failure
- Which of the following sentences correctly describes the encrypted cache?
  - Encrypted cache is stored in the device native storage. Its size is limited by the free space on a device, therefore large amounts of data can be stored.
  - HTML5 WebStorage is used for storing encrypted cache; therefore the amount of data stored in it is limited to several megabytes
  - Encrypted cache is stored on Worklight server. Its size is limited by the free space in the Worklight Server database, therefore large amounts of data can be stored
  - Encrypted cache is stored in virtual memory. Its size is limited by the device RAM and it is erased each time the user quits the application.

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