IBMCLOUD

CONNECTING PHP APPLICATION WITH CLOUDANT DATABASE

Name: Bikash Das
Pondicherry University

I have divided into 2 parts, in part A we will use our local machine and in part B we will upload the files to cloud

Bikash Das PU

- Part A - Deploying in local machine (note: you must have installed and configured php and apache web server in local machine)
  - Cloudant
  - CouchDB
  - http methods
  - Curl
  - futon
  - Php sending data over http
- Part B - Deploying in cloud (note: Everything is configured for us, no worries)
  - Create a php instance
  - Create a Cloudant service and link them
  - Upload the source files to the cloud

Cloudant (brief intro)

Bikash Das
PU

- **Cloudant** is an IBM software product, which is primarily delivered as a cloud-based service.
- Secure: Data's are encrypted
- Data Flexibility: Flexible JSON schema and powerful API that is compatible with Apache **CouchDB**
- General Availability: Available in all IBM Cloud regions

NOTE: for this demonstration purpose, I will use in **CouchDB.**

Later we will use **Cloudant**

CouchDB

- CouchDB falls into the category of databases called NoSQL
- NoSQL is an acronym for Not Only SQL
- SQL database stores info in terms of tables and have schemas whereas NoSQL are generally less bound to schema.
- CouchDB data models are documents and every documents has a required ID field and that makes the document uniquely identifiable.

Bikash Das
PU

CouchDB Document

Bikash Das
PU

A Sample Document

```
{
  "_id": "121ebd24666e0fde290172acbf00d5d4",
  "_rev": "1-9650007cab14f567a6aeef7cda9c2cfa",
  "type": "user",
  "name": "Bikash",
  "msg": "A secret message"
}
```

Each document has reserved fields for metadata such as id, revision and deleted.

_id = it stores the id of the document which is unique

_rev = it indicates the revision id. Every time you make changes to the document a new rev value will be generated.

HTTP METHODS

Bikash Das PU

- Four main HTTP Methods for communicating with CouchDB
  - GET, PUT, POST and DELETE
- Four main operations we perform on databases
  - Create, Read, Update and Delete (CRUD)

CRUD	HTTP Methods
CREATE	POST
READ	GET
UPDATE	PUT
DELETE	DELETE

- We will use **CURL** to explore each of the http methods.

curl

- cURL – Client for URLs or Client URL Request Library
- CouchDB cURL utility is used to communicate with CouchDB database
- curl is a command-line tool for getting or sending data including files using URL syntax
- Curl tool is used to transfer data from or to a server by using one of the supported protocols like HTTP, HTTPS, FTP, etc
- It is a command-line utility to access HTTP protocol straight away from the command line. E.g.: curl www.google.com

Bikash Das
PU

Using curl to access CouchDB

- Make sure CouchDB is installed or else Download CouchDB from http://couchdb.apache.org/ and install
  - Go to apache config file eg: C:\Apache24\con
  - Open httpd.cnf file. Search for #LoadModule rewrite_module modules/mod_rewrite.so **Remove #**
  - Also search for Options Indexes FollowSymLinks, below you will find AllowOverride **None**, Change to **All**
- Check if installed
  - In cmd type: **curl http://localhost:5984/**
  - If reply come {couch: welcome ..} it means installed
- LIST ALL THE DATABASE: curl –X GET http://localhost:5984/**_all_dbs**
- Create a database: curl –X PUT http://localhost:5984/**dbname**
  - Note: dbname = your database name

Bikash Das PU

Using curl to access CouchDB

- Get all documents from database
  - curl –X GET http://localhost:5984/database_name/_all_docs
- Create a document in a database
  - (note: In windows we need to escape characters. So, use this command in Linux or git bash in windows)
  - curl -X PUT -H "Content-Type:application/json" -d '{"type":"user","Name":"Bikash Das", "Location":"Pondicherry University"}' http://localhost:5984/mydb/1
- Update a document in a database
  - Pass the revision id to update a document
  - curl -H 'Content-Type: application/json' -X PUT http://localhost:5984/mydb/1/ -d '{"Name":"Bikash","Location":"India", "_rev":"1-5106e13a3423cd7f9a47d9254d8d0e81"}'

Using curl to access CouchDB

Bikash Das
PU

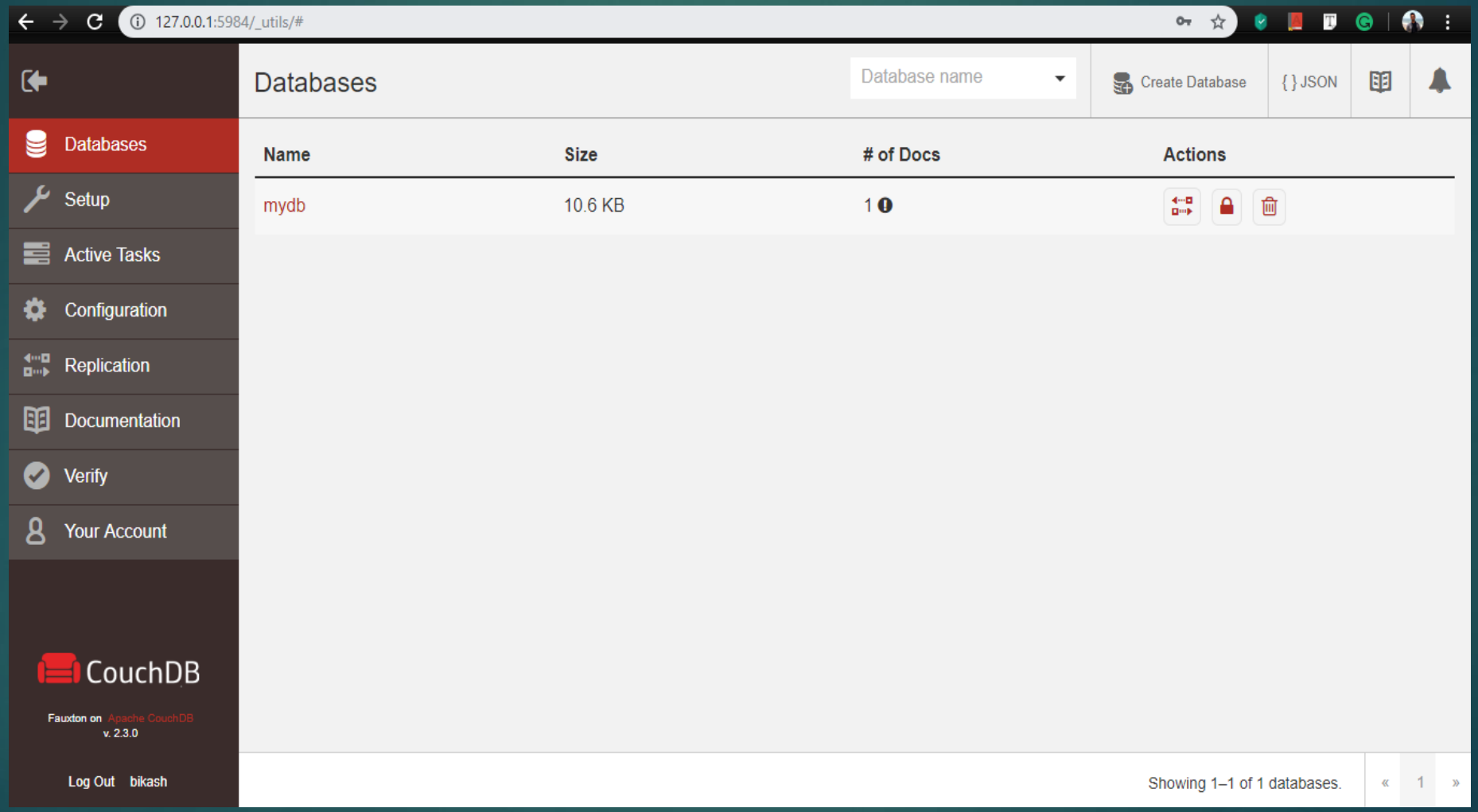
- Delete a document
  - First get the revision id (_rev) of a document
  - Curl –H 'Content-Type: application/json' –X DELETE http://localhost:5984/database_name/database_id?rev=_rev
  - E.g. : curl -H 'Content-Type: application/json' -X DELETE http://localhost:5984/mydb/1?rev=3-ace56d6d59d6eda4a8331cf6b82c0e1a
- When username and password is set:
  - add –u username:password
  - curl –u username:password –X GET http://localhost:5984/
- To see how the connection is being established. Add –v with any curl statement, for e.g.:
  - curl -v -X GET http://localhost:5984/_all_dbs

Futon (GUI)

- CouchDB comes with a build-in web-based administration console called **Futon**.
- Futon has a simple interface which allows you to manage databases, users and documents .
- It comes packed with CouchDB. There's no need to download separately.
- Open browser and visit
  - http://127.0.0.1:5984/_utils/

Bikash Das
PU

Futon (GUI)


127.0.0.1:5984/_utils/#
Databases
Database name
Create Database
{ } JSON
Databases
Setup
Active Tasks
Configuration
Replication
Documentation
Verify
Your Account
Name
Size
# of Docs
Actions
mydb
10.6 KB
1
CouchDB
Fauxton on Apache CouchDB
v. 2.3.0
Log Out bikash
Showing 1–1 of 1 databases.
«
1
»

PHP – SENDING DATA OVER HTTP

Bikash Das
PU

- The curl extension to php is designed to allow you to use a variety of web resources from within your PHP script.
- There are four steps:
  - Initialize Curl -> $curl = curl_init();
  - Set your options -> curl_setopt($curl, CURLOPT_URL, http://www.php.net)
  - Execute curl query -> curl_exec($curl);
  - Close URL -> curl_close($curl)
- Step 2 is the complicated one, because majority of the work takes place here

PHP

Curl options	description
CURLOPT_POST	1 if you want Curl to do a regular HTTP POST
CURLOPT_RETURNTRANSFER	1 if you want Curl to return the transfer data instead of printing it out directly
CURLOPT_URL	A string containing the URL you want Curl to fetch
CURLOPT_HEADER	("Content-Type: application/json"
CURLOPT_USERPWD	A String formatted in the username:password manner, for Curl to give to the remote server if requested
CURLOPT_POSTFIELDS	A String containing the data to post in the HTTP "POST" operation
CURLOPT_CUSTOMREQUEST	Used when deleting

Bikash Das PU

Curl to php equivalent

Curlopt_httpheader =>
("Content-Type: application/json"

```
curl -X PUT -H "Content-Type:application/json"
-d '{"type":"user","Name":"Bikash Das", "Location":"Pondicherry University"}'
http://localhost:5984/mydb/id01
```

Curlopt_post => 1

Curlopt_url => “http://localhost:5984/mydb/

Curlopt_postfields => '{"type":"user","Name":"Bikash Das", "Location":"Pondicherry University"}'

Pass the id along with the url

Bikash Das
PU

PHP – CREATING A DOCUMENT

```
<form action="welcome.php" method="post">
  <input id="name" name="name" type="text" required placeholder="Enter Name"><br>
  <input id="msg" name="msg" type="text" required placeholder="Enter Secret Message"><br>
  <input id="s" type="Submit" value="Send">
</form>
```

Index.html

welcome.php file

```
$user = new stdClass;
$user->type = 'user';
$user->name = $_POST["name"];
$user->msg = $_POST["msg"];
 //echo json_encode($user);

$curl = curl_init();
// curl options
$options = array(
CURLOPT_URL => 'http://localhost:5984/mydb',
CURLOPT_POST => 1,
CURLOPT_POSTFIELDS => json_encode($user),
CURLOPT_HTTPHEADER => array ("Content-Type: application/json"),
CURLOPT_RETURNTRANSFER => true /* if not, curl_exec() throws output*/
);
curl_setopt_array($curl, $options);
curl_exec($curl);
curl_close($curl);
```

Post data coming from the form is stored in $user

Bikash Das PU

PHP – DISPLAYING DOCUMENTS

The code snippet to fetch a document from the database using id

```php
<?php
function get($id){
  // Get cURL resource
  $curl = curl_init();
  curl_setopt_array($curl, [
      CURLOPT_RETURNTRANSFER => true, //or 1
      CURLOPT_URL => 'localhost:5984/mydb/'.$id,
      CURLOPT_HTTPHEADER => array ("Content-Type: application/json"),
  ]);
  // Send the request & save response to $resp
  $resp = curl_exec($curl);
  $res= json_decode($resp,true); //result is associative array php
  curl_close($curl);
  echo $res;
}
```

Bikash Das
PU

PHP – DELETING DOCUMENT

The code to delete a document

You need to pass database name, revision id and document id to delete a document

```php
function deldoc($db,$rev,$id){
  $curl = curl_init();
  curl_setopt_array($curl, [
      CURLOPT_RETURNTRANSFER => true, //or 1
      CURLOPT_URL => 'http://localhost:5984/'.$db.'/'.$id.'?rev='.$rev,
      CURLOPT_CUSTOMREQUEST => 'DELETE'
  ]);
  curl_exec($curl);
  curl_close($curl);
  echo 'deleted document with id: '.$id;
}
```

Bikash Das PU

Part B

- We will create a php instance and add a Cloudant service to it. Link them and upload the source files.

Bikash Das
PU

Creating PHP instance

-IBMCLOUD

Bikash Das
PU

- **Sign Up** if you don't have IBM cloud account url: https://console.bluemix.net/registration/
- **Log In** using email and password
- Click on **Catalog** in the navigation bar
- Click on **Compute** in the side navigation bar
- Scroll down and choose PHP
- Give **app name**, **host name and set region** (which location's data centre you want to use) and click Create
- Click on **Visit App URL**
- A Sample App is Running

Download IBM Cloud CLI

Bikash Das
PU

- Use IBM Cloud command line interface to download, modify, and redeploy your Cloud Foundry applications and service instances.
- https://console.bluemix.net/docs/cli/reference/ibmcloud/download_cli.html#install_use
- Select the installer based on your Operating System.
- After downloading, Install it.

LOGIN through CLI

Bikash Das
PU

- Open **command prompt** in windows or Terminal in Linux
- Go to the folder where your files are stored or create a new folder
- Login to ibmcloud
- C:\Users\Bikash\Desktop\demo> **ibmcloud login**
- Enter the Email and Password
- Now type: **ibmcloud target --cf** to set CF API endpoint, Org and Space.
- Deploy: **ibmcloud app push app_name –b php_buildpack**
  - Note: app_name should be the name of your app you set while creating php instance

Creating Cloudant service instance -IBMCLOUD

Bikash Das PU

- **Sign Up** if you don't have IBM cloud account url: https://console.bluemix.net/registration/
- **Log In** using email and password
- Click on **Catalog** in the navigation bar
- Click on **Databases** in the side navigation bar
- Choose Cloudant
- Give **Service name**, choose region and set authentication methods and click **Create**
- Service is **started**, you will be redirected to dashboard

Link database with php instance

- Go to **Dashboard**, click on the name of the php application
- In the side navigation bar, click on **connection**
- To the right, you will see a button **Create connection**. Click on that.
- Leave the default and click on **Connect**.
- Click on **Restage** button.
- Done.

Bikash Das
PU

Service Credential

- **Dashboard**, click on database name
- Click on **service credential** from the side navigation bar
- Click **new credential**, Under service id, select auto generate
- Click **Add**
- A new Service Credential will be added which contains the username, password and the URL to connect to the Cloudant database with php application
- Click on **View credentials** and copy the URL

Bikash Das
PU

Service Credential

Bikash Das
PU


```
  "apikey": "pYi9MPcRw1hYnMP70H8JIiLaE-e6mXCGwvv4MAe-Y05B",
  "host": "d9cb693a-8304-4ff1-93a9-85516f86cc3d-bluemix.cloudantnosqldb.appdomain.cloud",
  "iam_apikey_description": "Auto generated apikey during resource-key operation for Instance - crn:v1:bluemix:publi
c:cloudantnosqldb:eu-gb:a/f3a2a451fa264d7591a20f7472f4d6df:82009d43-d2e1-4d81-a2e0-82cda41998da::",
  "iam_apikey_name": "auto-generated-apikey-86ce4abb-3127-4066-918b-ef7fc4a64dc8",
  "iam_role_crn": "crn:v1:bluemix:public:iam::::serviceRole:Manager",
  "iam_serviceid_crn": "crn:v1:bluemix:public:iam-identity::a/f3a2a451fa264d7591a20f7472f4d6df::serviceid:ServiceId-c
d80a067-9133-4182-ae24-46db6c186461",
  "password": "60f2a099aa6775d3284dc69f850d36e79975f2bafcf01fc2c2a61e6abaa1d7d2",
  "port": 443,
  "url": "https://d9cb693a-8304-4ff1-93a9-85516f86cc3d-bluemix:60f2a099aa6775d3284dc69f850d36e79975f2bafcf01fc2c2a61e
6abaa1d7d2@d9cb693a-8304-4ff1-93a9-85516f86cc3d-bluemix.cloudantnosqldb.appdomain.cloud",
  "username": "d9cb693a-8304-4ff1-93a9-85516f86cc3d-bluemix"
}
```


Copy the URL and paste it in the CURLOPT_URL field in php source code

Final Change

Copy the URL and paste it in the CURLOPT_URL field in php source code.

```php
$curl = curl_init();
// curl options
$options = array(
CURLOPT_URL => 'https://d9cb693a-8304-4ff1-93a9-85516f86cc3d-bluemix:60f2a099aa6775d3284dc69f850d36e79975f2bafcf01fc
2c2a61e6abaa1d7d2@d9cb693a-8304-4ff1-93a9-85516f86cc3d-bluemix.cloudantnosqldb.appdomain.cloud/mydb',
CURLOPT_POST => 1,
CURLOPT_POSTFIELDS => json_encode($user),
CURLOPT_HTTPHEADER => array ("Content-Type: application/json"),
CURLOPT_RETURNTRANSFER => true /* if not, curl_exec() throws output*/
);
curl_setopt_array($curl, $options);
curl_exec($curl);
curl_close($curl);
```

Bikash Das
PU

Upload

- Upload the files
  - First login from terminal: Ibmcloud login
  - Enter IBMCLOUD account: email and password
  - Upload the source code
  - C:\> ibmcloud app push app_name –b php_buildpack
- Visit the URL
- And Voila. It works!

Bikash Das
PU

References

- CouchDB The Definitive Guide
- PHP in a Nutshell book
- JSON PHP W3SCHOOL.COM
- https://www.javatpoint.com/couchdb-create-document
- https://codular.com/curl-with-php
- Ibmcloud documentation
- https://console.bluemix.net/docs/cli/reference/ibmcloud/download_cli.html#install_use
- https://searchcloudcomputing.techtarget.com/definition/Cloud-Foundry
- http://thisinterestsme.com/php-error-handling-curl/