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IBM Bluemix
Development & Certification

Summary decks for a course that covers the A to Z of IBM Bluemix.

For more information visit:
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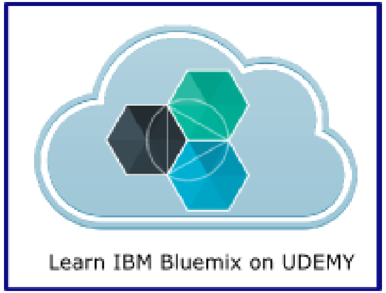
1. Data Service Types
2. Cloudant
3. DashDB

PS: Certification practice test questions NOT included in the summary decks

Discounted access to the courses:



https://www.udemy.com/ibm-bluemix/?couponCode=BLUE100

Coupon Code = **BLUE100**

https://www.udemy.com/rest-api/?couponCode=REST100

Coupon Code = **REST100**

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Data Service Types

DB Services on Bluemix

1. SQL Database Service

2. NoSQL Database Service

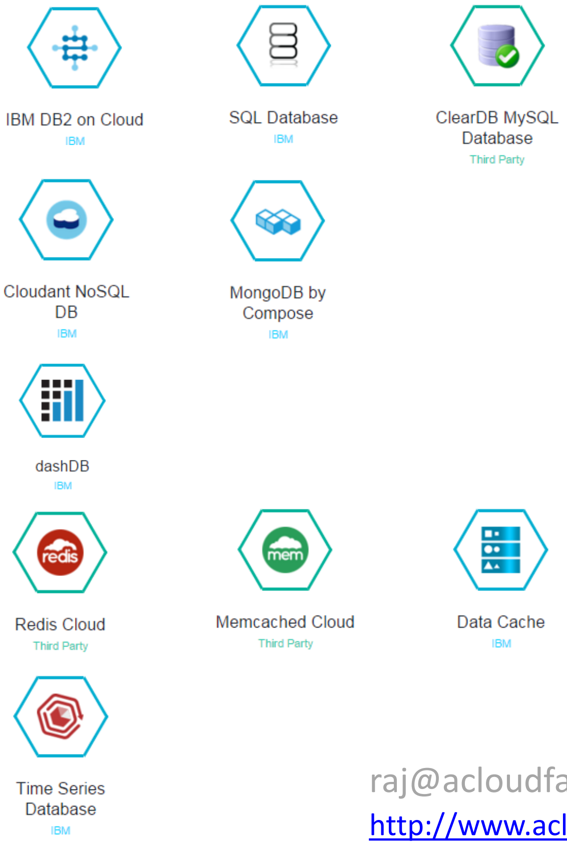
3. In memory columnar database

4. Key – Value pair

5. Time series

Summary

- RDBMS services on Bluemix
- NoSQL services on Bluemix
- In memory columnar
- Key value pair
- Timeseries database



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Cloudant

Cloudant - Features

- IBM Cloudant NoSQL is a database as a service (DBaaS)
  - Replicated over multiple nodes distributed across data centers
  - HandlesJSON data very efficiently
  - Optimized to handle concurrent reads and writes
  - Highly available & guarantees data durability
- Cloudant Sync allows data replication between the devices and the cloud
- Built on proven CouchDB
- Can be installed and managed on-premise

CRUD – Create, Retrieve, Update, Delete

- Restful API for CRUD operations
  - HTTP verbs used (GET, POST, PUT, DELETE)
  - Rest resources represent the document
- Each document has a unique _id (index)
  - You may create new indexeson fields in the document e.g., SSN

Cloudant Query

- Declarative JSON based querying syntax

```
{"selector" : {"age" : {"$gt" : 22} } }
```

  - API Endpoint `https://{account}-bluemix.cloudant.com/{dbname}/_find`

- Index needs to be defined on a field before it can be used in the selector
  - Wraps several index types, starting with primary index (_id)

Cloudant Index

- Primary index (_id) available out of the box
- Secondary indexes may be defined on any fields in the document
- Search indexes may be defined for flexible Lucene based search
- Created as a *Design Document (ddoc)* in the database

Cloudant Index Types

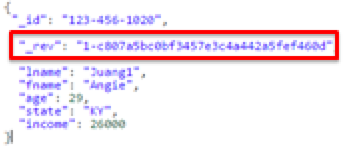
- type = **"json"** (a.k.a. secondary index)
  - Map Reduce views
  - Better performance compared to "text" type
- type = **"text"** (a.k.a. full text index)
  - Search index functions
  - Maximum flexibility
  - Lucene based indexing of the fields in the documents

Map Reduce View

- Map functions are used for selective filtering of documents based on some selector criteria
  - Written in Javascript; *emit* method generates the name-value pairs
  - Execution of query using view applies map function to all documents
- Reduce function generates aggregate from the documents produced by the map function
  - Built-in functions such as _count, _sum, _stats; custom functions possible

Insert

- API Endpoint `https://{account}-bluemix.cloudant.com/{dbname}`
- HTTP Method = POST, PUT INSERT Document
- HTTP Method=PUT, If the database does not exist it will be created
- _rev Automatically added/managed



```
{
  "_id": "123-456-1020",
  "_rev": "1-c807a5bc0bf3457e3c4a442a5fef460d"
  "lname": "Juang1",
  "fname": "Angie",
  "age": 29,
  "state": "KY",
  "income": 26000
}
```

_rev

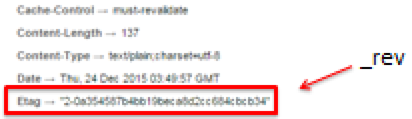
- Adds _rev field to the documents on INSERT
- New value assigned to _rev on UPDATE
- Used to ensure that client is updating or deleting the latest version of the document
- Used for ensuring replication of the latest document
- _rev value is internal to Cloudant
- _rev need to be passed for Update/Deletion of document

Update

- HTTP Method = POST `https://{account}-bluemix.cloudant.com/{dbname}`
  - You need to pass the _id & _rev field values for the document
  - Cannot update a specific fields in the document

Delete

- HTTP Method = HEAD `https://{account}-bluemix.cloudant.com/{dbname}/{id}`
  - Issue a HEAD request for _id that gets the _rev in Etag header



```
Cache-Control → must-revalidate
Content-Length → 137
Content-Type → text/plain;charset=utf-8
Date → Thu, 24 Dec 2015 03:48:57 GMT
Etag → "2-0a354587b4bb19beca8d2cc684cbcb34"
```

- HTTP Method = DELETE { "_rev" : "0a354587b4bb19beca8d2cc684cbcb34" }
  `https://{account}-bluemix.cloudant.com/{dbname}/{id}?rev=revision`
- HTTP Method = PUT { "_rev" : "0a354587b4bb19beca8d2cc684cbcb34" "_deleted" : true}

Replication

- Master – Master replication model
  - All replicas can be read from and written to i.e., no single master
  - Automatic resolution of version conflicts (by way of *_rev*)
  - Replicate continuously or at specific times
- Unique advantages
  - Highly scalable
  - High availability
  - Lower latency
  - Disconnected app usage

Cloudant Sync

- Enables you to push database to the edge - device
  - Mobile device
  - IoT Sensors
  - Internet enabled appliances
- Unique advantages
  - Client runs offline & automatically syncs with backend
  - Scale bigger

Summary

- INSERT & UPDATE by using HTTP POST/PUT methods
- DELETE can be carried out using PUT with a field "_deleted": true
- DELETE can be carried out using HTTP DELETE method
- For Delete/Update you need to pass _*rev* to ensure latest version is modified
- Replication is Master-Master; highly available, scalable
- Sync – enables data to be pushed to the edge e.g., mobile. Data is automatically synced between device and backend

DashDB

DashDB Features

dashDB

- Managed Data Warehousing Solution
- Loads data from multiple sources
- Run SQL/Queries against the data
- Run analytics against the data using R scripts
- Applications can connect using JDBC/ODBC

DashDB Console

- Upload geospatial data
- Upload local files (CSV, Tab separated …)
- SQL Query Assistance
- Save/Load SQL queries to/from local file system