Document Database Basics Couchbase

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Json Document


```
{
   "firstName": "John",
   "lastName": "Smith",
   "age": 25,
   "address":
   {
      "streetAddress": "21 2nd Street",
      "city": "New York",
      "state": "NY",
      "postalCode": "10021"
   },
   "phoneNumber":
   [
      {
        "type": "home",
        "number": "212 555-1234"
      },
      {
        "type": "fax",
        "number": "646 555-4567"
      }
   ]
}
```

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JSON Documents

- Map more closely to external API
- CRUD Operations, lightweight and implicit schema

```
myDocument = {
  “fields” : [“with basic types”, 3.14159, true],
  “like” : “your favorite language.”,
  “status”: {
    “apis” : true,
    “databases” : “document” }
}
```

- Stored under a unique identifier key

```
client.set(“mydocumentid”, myDocument);
mySavedDocument = client.get(“mydocumentid”);
```

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Benefits of JSON

- Can Represent Complex Objects and Data Structures
- Very simple notation, lightweight, compact, readable
- The most common API return type for Integrations
  - Facebook, Twitter, you name it, return JSON
  - Native to Javascript (can be useful)
  - Can be inserted straight into Couchbase (faster development)
- Serialization and Deserialization are very fast

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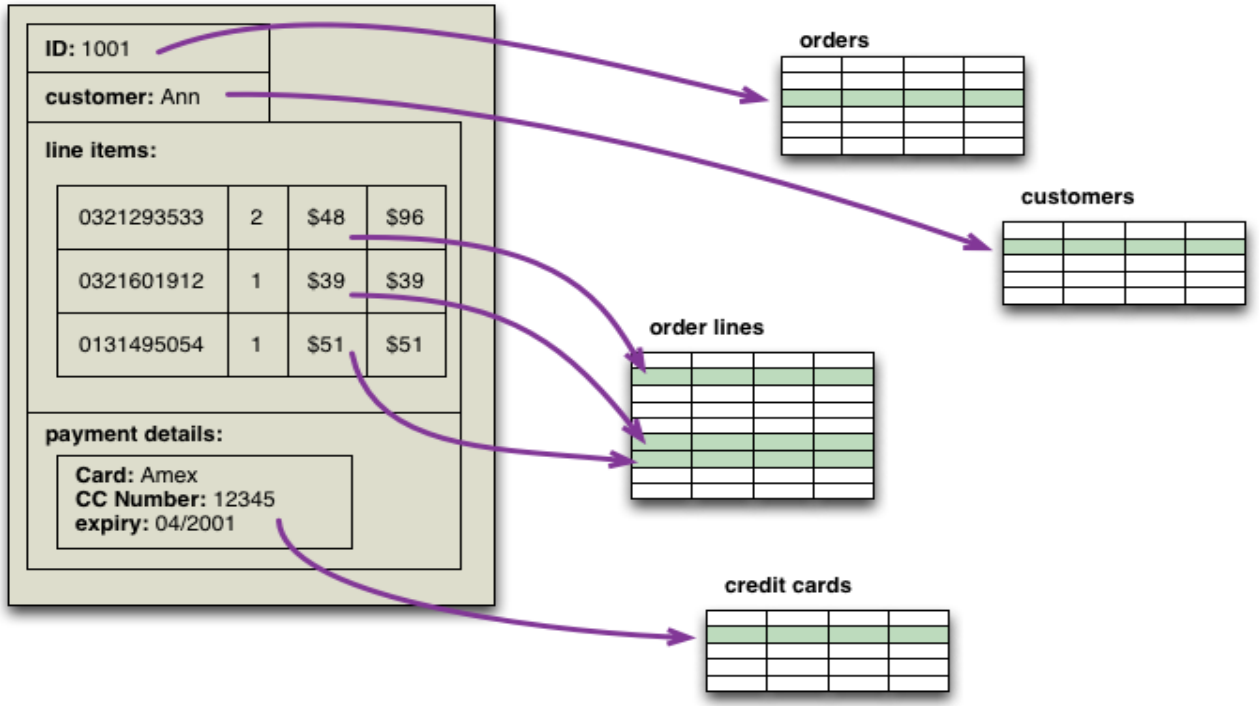
The relational approach to model data



Relational databases were not designed with clusters in mind, which is why people have cast around for an alternative. Storing aggregates as fundamental units makes a lot of sense for running on a cluster.

http://martinfowler.com/bliki/AggregateOrientedDatabase.html

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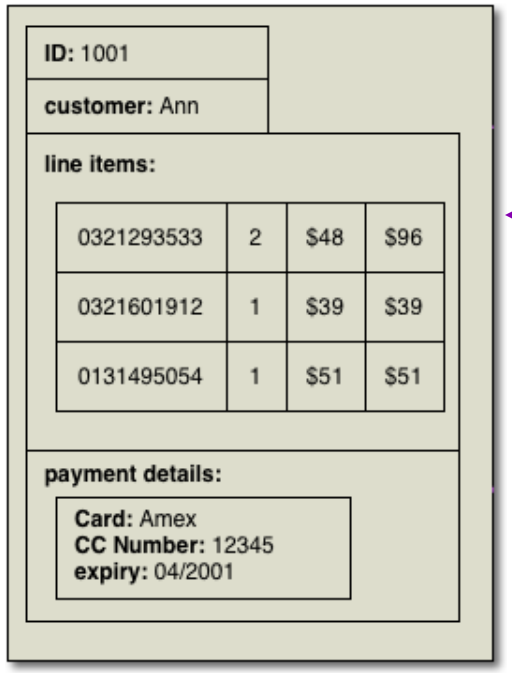
Compared to a Document Database



```
o::1001
{
uid: “ji22jd”,
customer: “Ann”,
line_items: [
        { sku: 0321293533, quan: 3,  unit_price: 48.0 },
        { sku: 0321601912, quan: 1, unit_price: 39.0 },
        { sku: 0131495054, quan: 1, unit_price: 51.0 }
],
payment: {
        type: “Amex”,
        expiry: “04/2001”,
        last5: 12345
}
```

- Easy to distribute data
- Makes sense to application programmers

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Object to JSON back to Object

User Object

string	uid
string	firstname
string	lastname
int	age
array	favorite_colors
string	email

u::michael.nitschinger@couchbase.com

```
{
"uid": 123456,
"firstname": "Michael",
"lastname": "Nitschinger",
"age": 24,
"favorite_colors": ["blue", "black"],
"email": "michael.nitschinger@cou…"
}
```

set()

get()

u::michael.nitschinger@couchbase.com

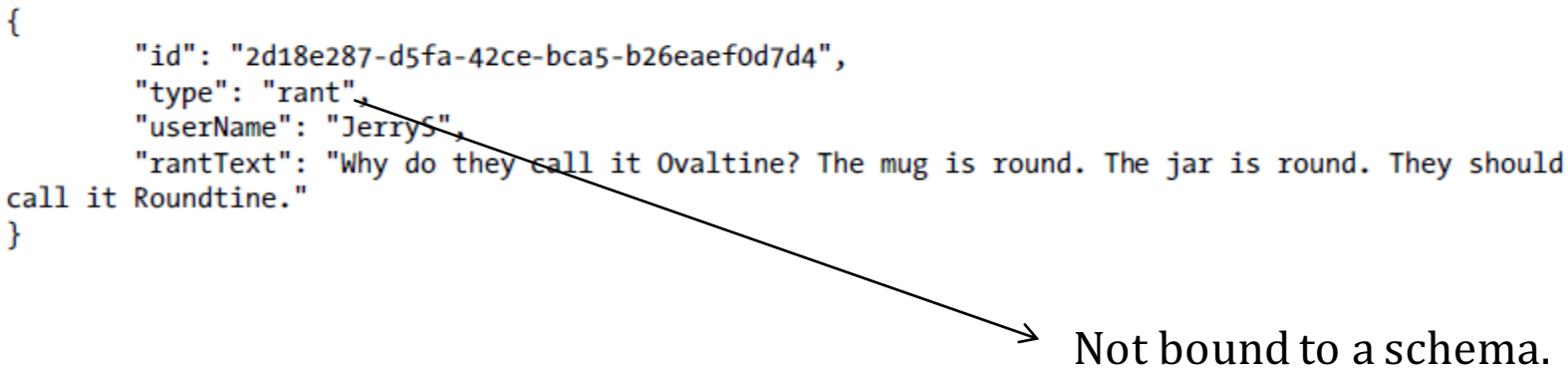
```
{
"uid": 123456,
"firstname": "Michael",
"lastname": "Nitschinger",
"age": 24,
"favorite_colors": ["blue", "black"],
"email": "michael.nitschinger@cou…"
}
```

User Object

string	uid
string	firstname
string	lastname
int	age
array	favorite_colors
string	email

Using a Document-Oriented Approach

- use documents in a specific format that stores data representing an object graph.
- documents are stored in JSON format.
- we do not represent the fields with null values.



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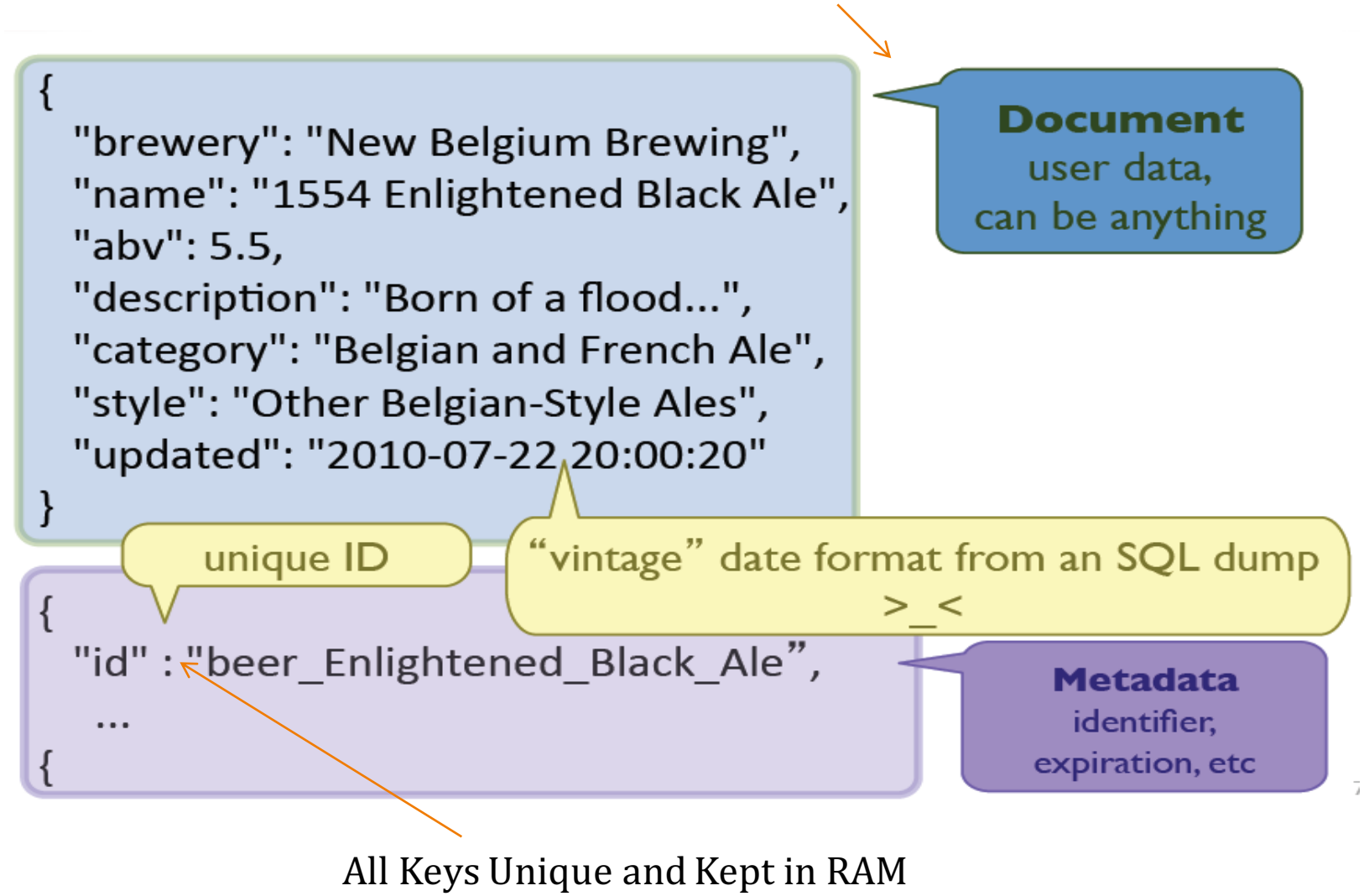
Meta + Document Body

Most Recent In Ram And Persisted To Disk



All Keys Unique and Kept in RAM

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Keys and Metadata

- **Keys** are unique identifiers for a document, and values are either JSON documents or byte stream etc
- By default, all documents contain three types of metadata which are provided by the Couchbase Server
  - **Cas** Value : - unique identifier associated with a document, and verified by the Couchbase Server before a document is deleted or changed.
  - **Time** to Live (ttl) — This is an expiration for a document typically specified in seconds
  - **Flags** —These are SDK- specific flags which are used to provides a variety of options during storage, retrieval, update, and removal of documents

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Keys and Metadata

- **Id**: Couchbase Server saves the document's key as part of the metadata.
- Type: Internally, Couchbase saves data in two formats:
  - **JSON**: Used whenever a valid JSON value is being saved in the database. JSON is also used to store counters that are created using the increment/decrement functionality in the SDKs.
  - **Base64**: All other data is being saved as Base64 encoded strings.
- **Rev**: This value is an internal revision ID used by Couchbase Server.

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No More alter table

- ✓ More productive developers!
- ✓ Emergent schema—
- ✓ Schema driven by code

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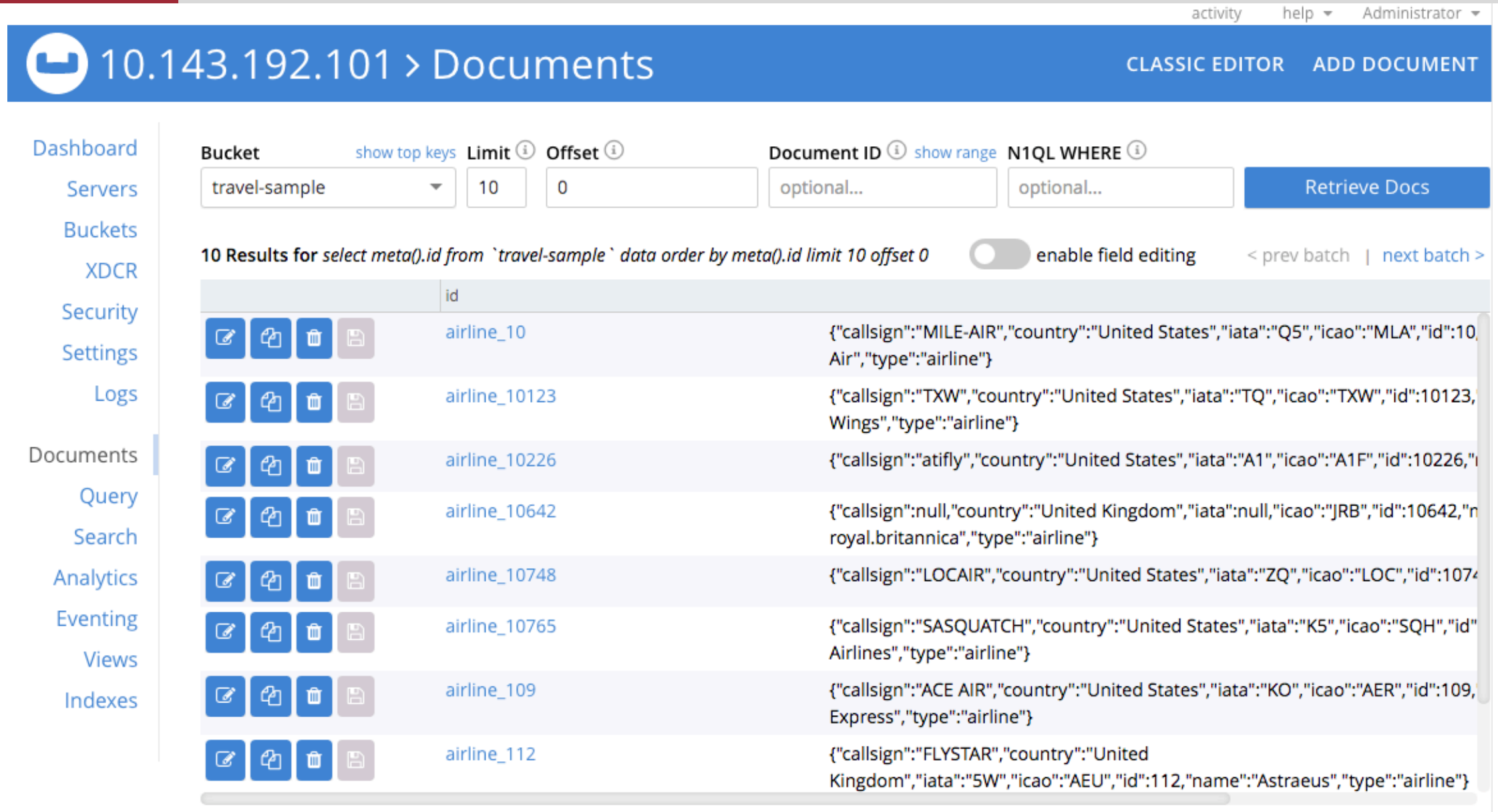
Creating Your First Document



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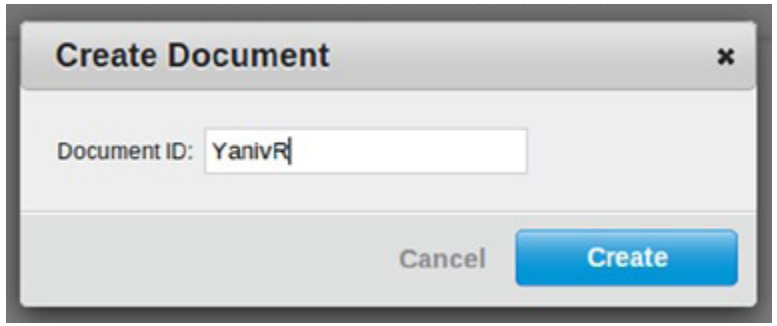
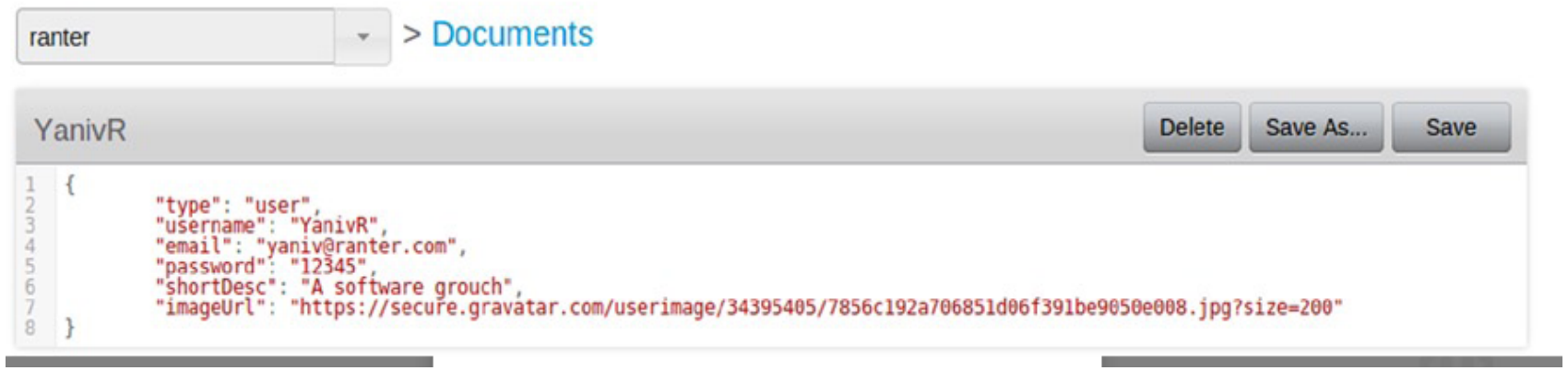
Creating Your First Document - TBD

- Document ID → Enter document detail



Enter the document details



Labs: Document Design (Optional)