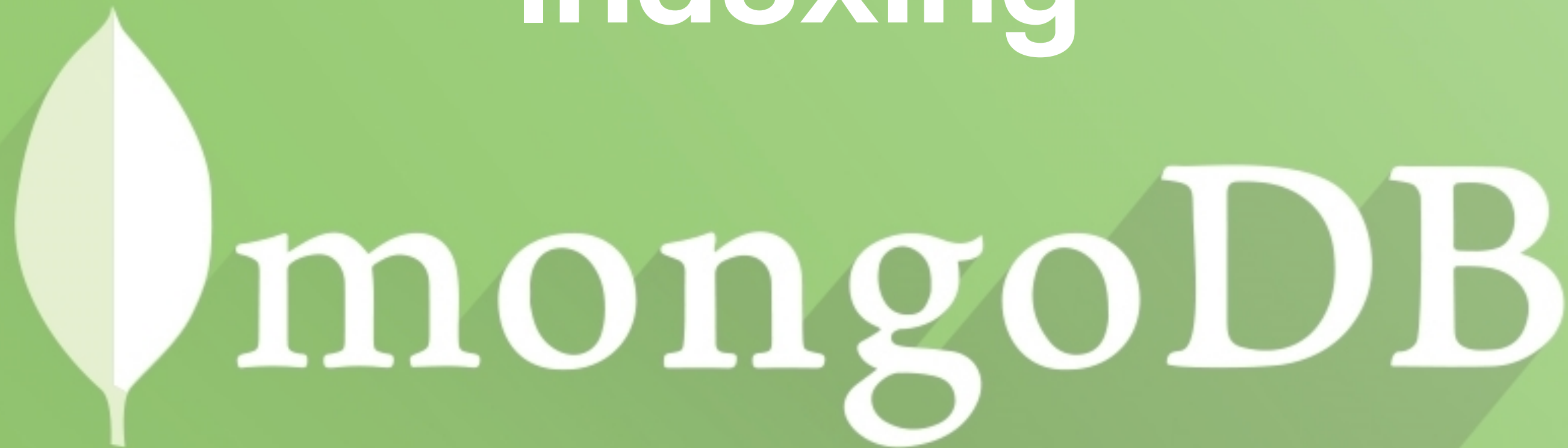


Indexing



สถาบัน ไอเอ็มซี



บริษัท สยามชำนาญกิจ จำกัด และเพื่อนพ้องน้องพี่

Indexing

Improve performance for query data



Indexing of MongoDB

Without indexes by default !!

Collection Scan == Full Table Scan

Default _id index



Index types

Single field

Compound index on multiple fields

Multiple index

...

<https://docs.mongodb.com/manual/indexes>



Explain query

```
>db.post.find({categories: "cat02"}).explain()
```



```
{
  "queryPlanner" : {
    "plannerVersion" : 1,
    "namespace" : "blog.post",
    "indexFilterSet" : false,
    "parsedQuery" : {
      "categories" : {
        "$eq" : "cat02"
      }
    },
    "winningPlan" : {
      "stage" : "COLLSCAN",
      "filter" : {
        "categories" : {
          "$eq" : "cat02"
        }
      }
    },
    "direction" : "forward"
  },
  "rejectedPlans" : [ ]
},
"serverInfo" : {
  "host" : "MacBook-Pro-2.local",
  "port" : 27017,
  "version" : "3.2.6",
  "gitVersion" : "05552b562c7a0b3143a729aaa0838e558dc49b25"
},
"ok" : 1
}
```



Show execution stat

```
>db.post.find({categories: "cat02"})  
      .explain("executionStats")
```



```
"executionStats" : {
  "executionSuccess" : true,
  "nReturned" : 5,
  "executionTimeMillis" : 0,
  "totalKeysExamined" : 0,
  "totalDocsExamined" : 6,
  "executionStages" : {
    "stage" : "COLLSCAN",
    "filter" : {
      "categories" : {
        "$eq" : "cat02"
      }
    },
    "nReturned" : 5,
    "executionTimeMillisEstimate" : 0,
    "works" : 8,
    "advanced" : 5,
    "needTime" : 2,
    "needYield" : 0,
    "saveState" : 0,
    "restoreState" : 0,
    "isEOF" : 1,
    "invalidates" : 0,
    "direction" : "forward",
    "docsExamined" : 6
  }
}
```



4 stages

COLLSCAN

IXSCAN

FETCH

SHARD_MERGE



Adding index

```
>db.post.createIndex({categories: 1})
```



Explain query again

```
"queryPlanner" : {
  "plannerVersion" : 1,
  "namespace" : "blog.post",
  "indexFilterSet" : false,
  "parsedQuery" : {
    "categories" : {
      "$eq" : "cat02"
    }
  },
  "winningPlan" : {
    "stage" : "FETCH",
    "inputStage" : {
      "stage" : "IXSCAN",
      "keyPattern" : {
        "categories" : 1
      },
      "indexName" : "categories_1",
      "isMultiKey" : true,
      "isUnique" : false,
      "isSparse" : false,
      "isPartial" : false,
      "indexVersion" : 1,
      "direction" : "forward",
      "indexBounds" : {
        "categories" : [
          ["cat02", "cat02"]
        ]
      }
    }
  }
}
```



Sorting

```
>db.post.find().sort({page:-1}).explain()
```



Multiple field ?

```
>db.post.find(  
  {categories: "cat02"})  
  .sort({page:-1}).explain()
```



Adding index

```
>db.post.createIndex(  
  {categories: 1, page: -1})
```



Explain query again

```
"winningPlan" : {  
  "stage" : "FETCH",  
  "inputStage" : {  
    "stage" : "IXSCAN",  
    "keyPattern" : {  
      "categories" : 1,  
      "page" : -1  
    },  
    "indexName" : "categories_1_page_-1",  
    "isMultiKey" : true,  
    "isUnique" : false,  
    "isSparse" : false,  
    "isPartial" : false,  
    "indexVersion" : 1,  
    "direction" : "forward",  
    "indexBounds" : {  
      "categories" : [  
        ["cat02", "cat02"]  
      ],  
      "page" : [  
        [MaxKey, MinKey]  
      ]  
    }  
  }  
},  
"rejectedPlans" : [ ]
```



List of indexes

```
>db.post.getIndexes()
```



Delete index

```
>db.post.dropIndex({categories: 1})
```



Control index use with hint()

```
>db.post.find(  
  {categories: "cat02"})  
  .sort({page:-1})  
  .hint( { page: -1 } ).explain()
```



Ignore all index

```
>db.post.find(  
  {categories: "cat02"})  
  .sort({page:-1})  
  .hint( { $natural: 1 } ).explain()
```



Resources

<https://github.com/up1/course-introduction-mongodb>

