Indexing

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Indexing

Improve performance for query data

Indexing of MongoDB

Without indexes by default !!

Collection Scan == Full Table Scan

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