

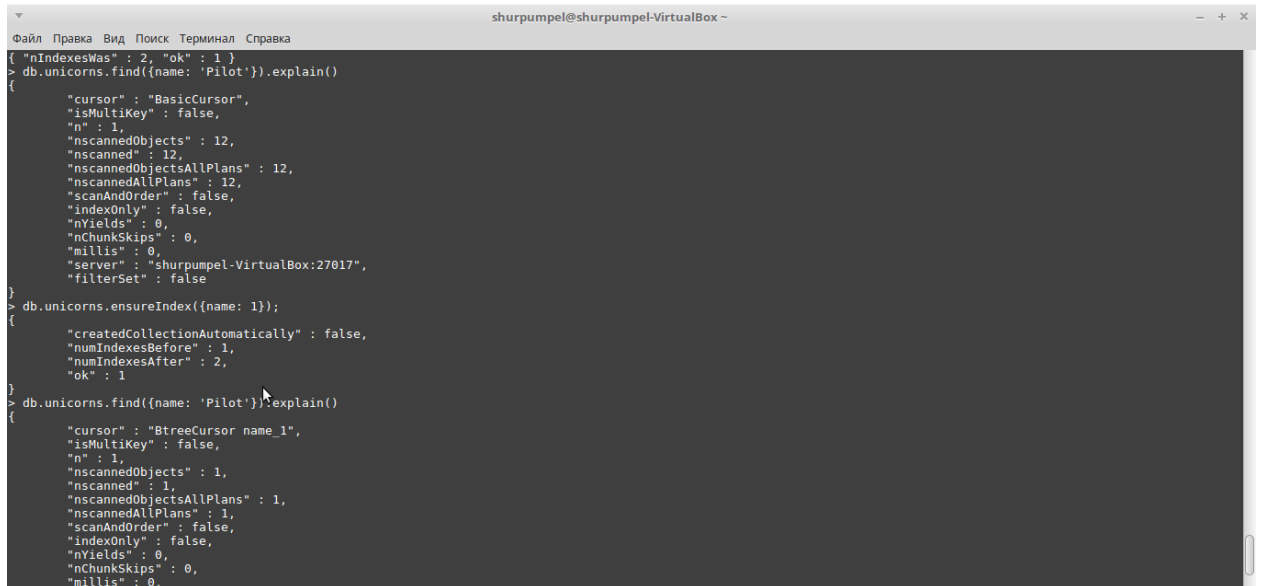
Нереляционные базы данных

Лабораторная работа 6

Производительность и инструментарий


Задания к лабораторной работе

1. Продемонстрируйте различные комбинации индексов в MongoDB на примере сортировки. Продемонстрируйте работу уникального индекса.
2. Продемонстрируйте работу explain для индексируемых и неиндексируемых коллекций.



```
shurpumpel@shurpumpel-VirtualBox ~
Файл Правка Вид Поиск Терминал Справка
{ "nIndexesWas" : 2, "ok" : 1 }
> db.unicorns.find({name: 'Pilot'}).explain()
{
  "cursor" : "BasicCursor",
  "isMultiKey" : false,
  "n" : 1,
  "nscannedObjects" : 12,
  "nscanned" : 12,
  "nscannedObjectsAllPlans" : 12,
  "nscannedAllPlans" : 12,
  "scanAndOrder" : false,
  "indexOnly" : false,
  "nYields" : 0,
  "nChunkSkips" : 0,
  "millis" : 0,
  "server" : "shurpumpel-VirtualBox:27017",
  "filterSet" : false
}
db.unicorns.ensureIndex({name: 1});
{
  "createdCollectionAutomatically" : false,
  "numIndexesBefore" : 1,
  "numIndexesAfter" : 2,
  "ok" : 1
}
db.unicorns.find({name: 'Pilot'}).explain()
{
  "cursor" : "BtreeCursor name_1",
  "isMultiKey" : false,
  "n" : 1,
  "nscannedObjects" : 1,
  "nscanned" : 1,
  "nscannedObjectsAllPlans" : 1,
  "nscannedAllPlans" : 1,
  "scanAndOrder" : false,
  "indexOnly" : false,
  "nYields" : 0,
  "nChunkSkips" : 0,
  "millis" : 0,
}
```

3. Продемонстрируйте сбор статистики для базы данных и коллекции.



```
> db.stats()
{
  "db" : "learn",
  "collections" : 10,
  "objects" : 85,
  "avgObjSize" : 104.47058823529412,
  "dataSize" : 8880,
  "storageSize" : 81920,
  "numExtents" : 10,
  "indexes" : 10,
  "indexSize" : 81760,
  "fileSize" : 67108864,
  "nsSizeMB" : 16,
  "dataFileVersion" : {
    "major" : 4,
    "minor" : 5
  },
  "extentFreeList" : {
    "num" : 3,
    "totalSize" : 147456
  },
  "ok" : 1
}
```

```

> db.unicorns.stats()
{
  "ns" : "learn.unicorns",
  "count" : 12,
  "size" : 2880,
  "avgObjSize" : 240,
  "storageSize" : 8192,
  "numExtents" : 1,
  "nindexes" : 2,
  "lastExtentSize" : 8192,
  "paddingFactor" : 1,
  "systemFlags" : 0,
  "userFlags" : 1,
  "totalIndexSize" : 16352,
  "indexSizes" : {
    "_id_" : 8176,
    "name_1" : 8176
  },
  "ok" : 1
}
>

```

4. Изучите веб-интерфейс MongoDB, сделайте вывод о возможностях его применения.

5. Продемонстрируйте работу профайлера для коллекций из задания 2.

```

db.system.profile.find().pretty()
{
  "op" : "query",
  "ns" : "learn1.system.namespaces",
  "query" : {

  },
  "ntoreturn" : 0,
  "ntoskip" : 0,
  "nscanned" : 4,
  "nscannedObjects" : 4,
  "keyUpdates" : 0,
  "numYield" : 0,
  "lockStats" : {
    "timeLockedMicros" : {
      "r" : NumberLong(134),
      "w" : NumberLong(0)
    },
    "timeAcquiringMicros" : {
      "r" : NumberLong(5),
      "w" : NumberLong(4)
    }
  },
  "nreturned" : 4,
  "responseLength" : 195,
  "millis" : 0,
  "execStats" : {
    "type" : "COLLSCAN",

```

```

        "works" : 6,
        "yields" : 0,
        "unyields" : 0,
        "invalidates" : 0,
        "advanced" : 4,
        "needTime" : 1,
        "needFetch" : 0,
        "isEOF" : 1,
        "docsTested" : 4,
        "children" : [ ]
    },
    "ts" : ISODate("2020-10-03T16:01:55.303Z"),
    "client" : "127.0.0.1",
    "allUsers" : [ ],
    "user" : ""
}
{
    "op" : "query",
    "ns" : "learn1.system.namespaces",
    "query" : {

    },
    "ntoreturn" : 0,
    "ntoskip" : 0,
    "nscanned" : 4,
    "nscannedObjects" : 4,
    "keyUpdates" : 0,
    "numYield" : 0,
    "lockStats" : {
        "timeLockedMicros" : {
            "r" : NumberLong(248),
            "w" : NumberLong(0)
        },
        "timeAcquiringMicros" : {
            "r" : NumberLong(9),
            "w" : NumberLong(8)
        }
    },
    "nreturned" : 4,
    "responseLength" : 195,
    "millis" : 0,
    "execStats" : {
        "type" : "COLLSCAN",
        "works" : 6,
        "yields" : 0,
        "unyields" : 0,
        "invalidates" : 0,
        "advanced" : 4,
        "needTime" : 1,
        "needFetch" : 0,

```

```

        "isEOF" : 1,
        "docsTested" : 4,
        "children" : [ ]
    },
    "ts" : ISODate("2020-10-03T16:01:56.260Z"),
    "client" : "127.0.0.1",
    "allUsers" : [ ],
    "user" : ""
}
{
    "op" : "query",
    "ns" : "learn1.unicorns",
    "query" : {
        "gender" : "m"
    },
    "ntoreturn" : 0,
    "ntoskip" : 0,
    "nscanned" : 12,
    "nscannedObjects" : 12,
    "keyUpdates" : 0,
    "numYield" : 0,
    "lockStats" : {
        "timeLockedMicros" : {
            "r" : NumberLong(157),
            "w" : NumberLong(0)
        },
        "timeAcquiringMicros" : {
            "r" : NumberLong(3),
            "w" : NumberLong(4)
        }
    },
    "nreturned" : 7,
    "responseLength" : 991,
    "millis" : 0,
    "execStats" : {
        "type" : "COLLSCAN",
        "works" : 14,
        "yields" : 0,
        "unyields" : 0,
        "invalidates" : 0,
        "advanced" : 7,
        "needTime" : 6,
        "needFetch" : 0,
        "isEOF" : 1,
        "docsTested" : 12,
        "children" : [ ]
    },
    "ts" : ISODate("2020-10-03T16:02:19.109Z"),
    "client" : "127.0.0.1",
    "allUsers" : [ ],

```

```

    "user" : ""
  }
  {
    "op" : "query",
    "ns" : "learn1.system.indexes",
    "query" : {
      "expireAfterSeconds" : {
        "$exists" : true
      }
    },
    "ntoreturn" : 0,
    "ntoskip" : 0,
    "nscanned" : 1,
    "nscannedObjects" : 1,
    "keyUpdates" : 0,
    "numYield" : 0,
    "lockStats" : {
      "timeLockedMicros" : {
        "r" : NumberLong(161),
        "w" : NumberLong(0)
      },
      "timeAcquiringMicros" : {
        "r" : NumberLong(7),
        "w" : NumberLong(6)
      }
    },
    "nreturned" : 0,
    "responseLength" : 20,
    "millis" : 0,
    "execStats" : {
      "type" : "COLLSCAN",
      "works" : 3,
      "yields" : 0,
      "unyields" : 0,
      "invalidates" : 0,
      "advanced" : 0,
      "needTime" : 2,
      "needFetch" : 0,
      "isEOF" : 1,
      "docsTested" : 1,
      "children" : [ ]
    },
    "ts" : ISODate("2020-10-03T16:02:20.736Z"),
    "client" : "0.0.0.0",
    "allUsers" : [
      {
        "user" : "__system",
        "db" : "local"
      }
    ],
  },

```

```

    "user" : "__system@local"
  }
  {
    "op" : "query",
    "ns" : "learn1.system.profile",
    "query" : {

      },
    "ntoreturn" : 0,
    "ntoskip" : 0,
    "nscanned" : 4,
    "nscannedObjects" : 4,
    "keyUpdates" : 0,
    "numYield" : 0,
    "lockStats" : {
      "timeLockedMicros" : {
        "r" : NumberLong(189),
        "w" : NumberLong(0)
      },
      "timeAcquiringMicros" : {
        "r" : NumberLong(7),
        "w" : NumberLong(6)
      }
    },
    "nreturned" : 4,
    "responseLength" : 2298,
    "millis" : 0,
    "execStats" : {
      "type" : "COLLSCAN",
      "works" : 6,
      "yields" : 0,
      "unyields" : 0,
      "invalidates" : 0,
      "advanced" : 4,
      "needTime" : 1,
      "needFetch" : 0,
      "isEOF" : 1,
      "docsTested" : 4,
      "children" : [ ]
    },
    "ts" : ISODate("2020-10-03T16:02:29.580Z"),
    "client" : "127.0.0.1",
    "allUsers" : [ ],
    "user" : ""
  }
}

```

6. Сделайте резервную копию одной из коллекций. Удалите ее и восстановите из резервной копии.


```
shurpumpel@shurpumpel-VirtualBox ~ $ mongoexport --db learn1 -collection unicorns --csv -fields name,weight,vampires
connected to: 127.0.0.1
name,weight,vampires
"Horny",600.0,63.0
"Aurora",450.0,43.0
"Unicrom",984.0,182.0
"Rooooooodles",575.0,99.0
"Solnara",550.0,80.0
"Ayna",733.0,40.0
"Kenny",690.0,39.0
"Raleigh",421.0,2.0
"Leia",601.0,33.0
"Pilot",650.0,54.0
"Nimue",540.0,
"Dunx",704.0,165.0
exported 12 records
```