

# Setting MongoDB for Ubuntu Xenial

In this section, I will install, configure, and test MongoDB connectivity.

Step 1 : I import the GPG keys of MongoDB© required by the Ubuntu package manager apt.

```
root@221bbs: ~  
root@221bbs:~# apt-key adv --keyserver hkp://keyserver.ubuntu.com:80 --recv EA312927  
Executing: /tmp/tmp.FWdIIVkT3L/gpg.1.sh --keyserver  
hkp://keyserver.ubuntu.com:80  
--recv  
EA312927  
gpg: requesting key EA312927 from hkp server keyserver.ubuntu.com  
gpg: key EA312927: "MongoDB 3.2 Release Signing Key <packaging@mongodb.com>" not changed  
gpg: Total number processed: 1  
gpg: unchanged: 1  
root@221bbs:~#
```

Step 2 : I add MongoDB entry to the apt repository list

```
root@221bbs: ~  
root@221bbs:~# echo "deb http://repo.mongodb.org/apt/ubuntu \"$lsb_release -sc\"/mongodb-org/3.2 multiverse" | sudo tee /tmp/mongodb-org-3.2.list  
deb http://repo.mongodb.org/apt/ubuntu xenial/mongodb-org/3.2 multiverse  
root@221bbs:~#
```

Step 3 : I proceed to installing MongoDB with apt

```
root@221bbs: ~  
root@221bbs:~# sudo apt-get update && sudo apt-get install -y mongodb-org  
Get:1 http://security.ubuntu.com/ubuntu xenial-security InRelease [94.5 KB]  
Hit:2 http://ppa.launchpad.net/nathan-renniewaldock/flux/ubuntu xenial InRelease  
Hit:3 http://ppa.launchpad.net/noobs-lab/icons/ubuntu xenial InRelease  
Hit:4 http://ppa.launchpad.net/noobs-lab/themes/ubuntu xenial InRelease  
Ign:5 http://repo.mongodb.org/apt/ubuntu xenial/mongodb-org/3.2 InRelease  
Hit:6 http://ppa.launchpad.net/snwh/cilip/ubuntu xenial InRelease  
Hit:7 http://repo.mongodb.org/apt/ubuntu xenial/mongodb-org/3.2 Release  
[Connecting to a cache u...]  
Step 3 - Update the repository
```

Step 4 : In order to launch the server, Mongod daemon must be invoked and since Ubuntu Xenial uses systemd, I create a new MongoDB systemd service file as /lib/systemd/system/mongod.service

```
/lib/systemd/system/mongod.service - Sublime Text (UNREGISTERED)  
File Edit Selection Find View Goto Tools Project Preferences Help  
hostapd.conf x udhcpd.conf x udhcpd x mongod.service x wpa_supplicant.conf x  
1 [Unit]  
2 Description=High performance, schema-free document-oriented database  
3 After=network.target  
4 Documentation=https://docs.mongodb.org/manual  
5  
6 [Service]  
7 User=mongodb  
8 Group=mongodb  
9 ExecStart=/usr/bin/mongod --quiet --auth --config /etc/mongod.conf  
10 LimitFSIZE=infinity # file size  
11 LimitCPU=infinity # cpu time  
12 LimitAS=infinity # virtual memory size  
13 LimitNOFILE=64000 # open files  
14 LimitNPROC=64000 # processes/threads  
15 TasksMax=infinity # total threads (user+kernel)  
16 TasksAccounting=false  
17 # Recommended limits for mongod as specified in  
18 # http://docs.mongodb.org/manual/reference/ulimit/#recommended-settings  
19  
20 [Install]  
21 WantedBy=multi-user.target
```

Step 5 : I update afterwards the newly defined systemd service

```
root@221bbs: ~  
root@221bbs:~# systemctl daemon-reload  
root@221bbs:~#
```

Step 6 : I launch mongod – MongoDB daemon – the server is running on port 27017 of local host

```
root@221bbs: ~  
root@221bbs:~# systemctl start mongod  
root@221bbs:~# netstat -plntu  
Active Internet connections (only servers)  
tcp        0 0 0.0.0.0:27017 0.0.0.0:*        LISTEN     16216/mongod  
tcp        0 0 0.0.0.0:22    0.0.0.0:*        LISTEN     1186/sshd  
tcp6       0 0 :::22        :::*             LISTEN     1186/sshd  
udp        0 0 0.0.0.0:5353 0.0.0.0:*          16612/chrome  
udp        0 0 0.0.0.0:5353 0.0.0.0:*          16612/chrome  
udp        0 0 0.0.0.0:5353 0.0.0.0:*          831/avahi-daemon: r  
udp        0 0 0.0.0.0:57399 0.0.0.0:*          831/avahi-daemon: r  
udp        0 0 0.0.0.0:11153 0.0.0.0:*          1649/dnsmasq  
udp        0 0 0.0.0.0:68    0.0.0.0:*          1633/dhclient  
udp        0 0 0.0.0.0:631   0.0.0.0:*          4384/cups-browsed  
udp6       0 0 :::5353     :::*             16612/chrome  
udp6       0 0 :::5353     :::*             831/avahi-daemon: r  
udp6       0 0 :::38907    :::*             1649/dnsmasq  
udp6       0 0 :::47582    :::*             831/avahi-daemon: r  
root@221bbs:~#
```

Step 7 : I create a new database “LabDK” and then use mongoimport in the Linux shell to import the moviepeople-10 json file as the mp10 collection within the LabDK database :

*mongoimport --db LabDK --collection mp10 --type json --file  
/home/moriarty/Desktop/DK/BigDataArchitecture/LAB-MONGO/moviepeople-10.json*

```
moriarty@221bbs:~$ mongo  
MongoDB shell version: 3.2.10  
connecting to: test  
Server has startup warnings:  
2016-11-05T23:39:10.855+0100 I CONTROL [initandlisten] ** WARNING: /sys/kernel/mm/transparent_hugepage/enabled is 'always'.  
2016-11-05T23:39:10.855+0100 I CONTROL [initandlisten] We suggest setting it to 'never'  
2016-11-05T23:39:10.855+0100 I CONTROL [initandlisten] **  
2016-11-05T23:39:10.855+0100 I CONTROL [initandlisten] ** WARNING: /sys/kernel/mm/transparent_hugepage/defrag is 'always'.  
2016-11-05T23:39:10.855+0100 I CONTROL [initandlisten] We suggest setting it to 'never'  
2016-11-05T23:39:10.855+0100 I CONTROL [initandlisten] **  
> use LabDK  
switched to db LabDK  
> exit  
bye  
moriarty@221bbs:~$ mongoimport --db LabDK --collection mp10 --type json --file /home/moriarty/Desktop/DK/BigDataArchitecture/LAB-MONGO/moviepeople-10.j  
son  
2016-11-05T23:45:25.416+0100 connected to: localhost  
2016-11-05T23:45:25.451+0100 imported 10 documents
```

Step 8 : We retrieve all the documents by querying the mongo client :

*db.mp10.find()*

```
moriarty@221bbs:~$ mongo  
MongoDB shell version: 3.2.10  
connecting to: test  
Server has startup warnings:  
2016-11-05T23:39:10.855+0100 I CONTROL [initandlisten] ** WARNING: /sys/kernel/mm/transparent_hugepage/enabled is 'always'.  
2016-11-05T23:39:10.855+0100 I CONTROL [initandlisten] We suggest setting it to 'never'  
2016-11-05T23:39:10.855+0100 I CONTROL [initandlisten] **  
2016-11-05T23:39:10.855+0100 I CONTROL [initandlisten] ** WARNING: /sys/kernel/mm/transparent_hugepage/defrag is 'always'.  
2016-11-05T23:39:10.855+0100 I CONTROL [initandlisten] We suggest setting it to 'never'  
2016-11-05T23:39:10.855+0100 I CONTROL [initandlisten] **  
> use LabDK  
switched to db LabDK  
> show collections  
mp10  
> db.mp10.find()  
{ "id": ObjectId("581e6105ac7eae0d1841a742"), "person-name": "C\u00e1ceres, Luciano", "info": { "trivia": [ "Grew up in Buenos Aires's neighborhood Ba\u00f1os de Flores.", "Was classmates of 'Sergio Surraco' (qv), 'Claudio Tolcachir' (qv), 'Lautaro Delgado' (qv) and 'Melina Petriella' (qv) at the drama school.", "Stepfather of 'Angela Torres (III)' (qv).", "Became a father for the 1st time at age 32 when his wife 'Gloria Carr\u00e1' (qv) gave birth to their daughter Amelia C\u00e1ceres on October 7, 2009.", "Met wife 'Gloria Carr\u00e1' (qv) in 2001, but they didn't become a couple until 2007.", "Is an accomplished stage actor/director.", "Was in a relationship with actress 'Laura Lopez Moyano' (qv) (2005-2007).", "His mother, political activist Hayde\u00e9 Bello, died of cancer on June 15, 2002.", "Studied acting with 'Alejandra Boero' (qv).", "He started taking acting classes at the age of 9.", "Son of 'Ernesto C\u00e1ceres' (qv) and Hayde\u00e9 Bello." ], "birthnotes": [ "Autonomous City of Buenos Aires, Argentina" ], "birthdate": [ "24 January 1977" ], "height": [ "187 cm" ], "spouse": [ "Gloria Carr\u00e1' (qv) (27 September 2008 - 2015) (separated); 1 child" ], "nicknames": [ "Lu" ], "trademark": [ "Curly hair", "Bright blue eyes" ], "interviews": [ "Clar\u00edn (Argentina), 9 January 2007, by: Mar\u00eda Ana Rago, Luciano C\u00e1ceres: El teatro en la sangre" ] } }  
{ "id": ObjectId("581e6105ac7eae0d1841a743"), "person-name": "Hughart, Ronald P", "info": { "birthnotes": [ "Los Angeles, California, USA" ], "birthdate": [ "18 June 1961" ], "birthname": [ "Hughart, Ronald P" ] } }  
{ "id": ObjectId("581e6105ac7eae0d1841a744"), "person-name": "O'Brien, Robert", "info": { "birthnotes": [ "New York City, New York, USA" ], "birthdate": [ "8 May 1918" ], "deathdate": [ "7 November 2005" ], "spouse": [ "Lina Romay (I)" (qv) (1992 - 7 November 2005) (his death)" ], "deathnotes": [ "Los Angeles, California, USA" ] } }  
{ "id": ObjectId("581e6105ac7eae0d1841a745"), "person-name": "Goyanes, Mar\u00eda Jos\u00e9", "info": { "trivia": [ "Mother of actor 'Javier Collado (I)' (qv).", "Sister of actress 'Mara Goyanes' (qv).", "Daughter of actress 'Mimi Mu\u00f1oz' (qv).", "Sister of actress 'Vicky Lagos (I)' (qv).", "Sister of actress 'Concha Goyanes' (qv).", "Sister-in-law of actor 'Ismael Merlo' (qv).", "birthnotes": [ "Spain" ], "birthdate": [ "8 December 1948" ], "spouse": [ "Manuel Collado' (qv) (2 - 2)" ], "birthname": [ "Mu\u00f1oz, Mar\u00eda Jos\u00e9 Goyanes" ] } }  
{ "id": ObjectId("581e6105ac7eae0d1841a746"), "person-name": "Rath, Stokely", "info": { "birthdate": [ "22 June 1932" ] } }  
{ "id": ObjectId("581e6105ac7eae0d1841a747"), "person-name": "Stokely, Charlotte", "info": { "trivia": [ "Is represented by John Baumgartner and Sandra McCarthy's Nevada-organized talent agency OC Modeling LLC." ], "mini biography": [ "Very cute and slim 5'3 blonde Charlotte Stokely was born on August 8, 1986 in Salt Lake City, Utah. Stokely decided to pursue a career in the adult entertainment industry after her stripper roommate was asked to participate in a hardcore shoot and Stokely herself was approached to appear on camera as well. After initially establishing herself in hardcore shoots for primarily Florida-based adult websites, Charlotte subsequently got herself an agent and moved to Los Angeles, California to advance her career by doing features for such top companies as FM Concepts, Sin City, Evil Angel, Wicked Pictures, Zero Tolerance, Evasive Angles, Digital Playground, Pulse Distribution, and Pure Play Media. Stokely was nominated for an AVN Award for Best New Starlet in 2007. Moreover, Charlotte has also modeled for several American Apparel ads. She enjoys playing Dungeons & Dragons in her spare time." ], "birthnotes": [ "Utah, USA" ], "birthdate": [ "8 August 1986" ], "height": [ "160 cm" ], "birthname": [ "Vitale, Brittney" ] } }
```

# MongoDB : import, query

1 - I import cities.json and moviepeople-3000.json using mongoimport in the Linux shell into the LabDK database to the collections mp3000 and cts respectively

```
mongoimport --db LabDK --collection mp3000 --type json --file
/home/moriarty/Desktop/DK/BigDataArchitecture/LAB-MONGO/moviepeople-3000.json

mongoimport --db LabDK --collection cts --type json --file
/home/moriarty/Desktop/DK/BigDataArchitecture/LAB-MONGO/cities.json
```

```
moriarty@221bbs:~$ mongoimport --db LabDK --collection mp3000 --type json --file /home/moriarty/Desktop/DK/BigDataArchitecture/LAB-MONGO/moviepeople-3000.json
2016-11-05T23:58:39.575+0100 connected to: localhost
2016-11-05T23:58:39.933+0100 imported 3000 documents
moriarty@221bbs:~$ mongoimport --db LabDK --collection cts --type json --file /home/moriarty/Desktop/DK/BigDataArchitecture/LAB-MONGO/cities.json
2016-11-05T23:58:49.592+0100 connected to: localhost
2016-11-05T23:58:51.307+0100 imported 99838 documents
```

2 - The query to find Anabela Teixeira :

```
db.mp3000.find( { "person-name": "Teixeira, Anabela" } )
```

```
moriarty@221bbs:~$ show collections
cts
mp10
mp3000
> db.mp3000.find( { "person-name": "Teixeira, Anabela" } )
{ "_id" : ObjectId("581e641fac7eae0d1841a901"), "person-name" : "Teixeira, Anabela", "info" : { "trivia" : [ "Her favorite actor is 'Marcello Mastroianni' and her favorite actress is 'Juliette Binoche' (qv).", "Partner of musician Frederico Pereira.", "Has two brothers, one biological and one adopted.", "Vice-President of the Portuguese Cinema Academy.", "She was first noticed by the public with the Tv series A Viuva do Enforcado (1992).", "Made her theater debut in 1992 in the play Os Processos of Dostolevsky.", "Did some workshops of dance: dance in movement with Peter Diez and dance classe s with Madalena Vitorino.", "Besides Portuguese, she speaks English and French." ], "birthnotes" : [ "Lisbon, Portugal" ], "birthdate" : [ "18 May 1973" ], "birthname" : [ "Teixeira, Anabela Cristina Alves" ], "interviews" : [ "TV Guia (Portugal), 1997, Iss. 960, pg. 24-25, by: Pedro Teixeira", "A Capital (Portugal), 30 April 1998, pg. 55, by: Helena Mata" ] } }
```

3 - Steven Spielberg was born in Cincinnati :

```
db.mp3000.find( { "person-name" : "Spielberg, Steven"}, { "info.birthnotes" : 1} )
```

```
moriarty@221bbs:~$ db.mp3000.find( { "person-name" : "Spielberg, Steven"}, { "info.birthnotes" : 1} )
{ "_id" : ObjectId("581e641fac7eae0d1841aa66"), "info" : { "birthnotes" : [ "Cincinnati, Ohio, USA" ] } }
```

4 - The number of people born in "Lisbon, Portugal" is 171:

```
db.runCommand( { count:'mp3000', query: { "info.birthnotes": "Lisbon, Portugal" } } )
```

```
moriarty@221bbs:~$ db.runCommand( { count:'mp3000',
... query: { "info.birthnotes": "Lisbon, Portugal" }
... } )
{ "waitedMS" : NumberLong(0), "n" : 171, "ok" : 1 }
```

5-

The query `db.mp3000.find({}, {"info.height" : 1})` shows that `info.height` is given in imperial and SI

```
moriarty@221bbs:~$ db.mp3000.find({}, {"info.height" : 1})
{ "_id" : ObjectId("581e641fac7eae0d1841a74c"), "info" : { } }
{ "_id" : ObjectId("581e641fac7eae0d1841a74d"), "info" : { } }
{ "_id" : ObjectId("581e641fac7eae0d1841a74e"), "info" : { } }
{ "_id" : ObjectId("581e641fac7eae0d1841a74f"), "info" : { "height" : [ "6' 2" ] } }
{ "_id" : ObjectId("581e641fac7eae0d1841a750"), "info" : { } }
{ "_id" : ObjectId("581e641fac7eae0d1841a751"), "info" : { "height" : [ "5' 9" ] } }
{ "_id" : ObjectId("581e641fac7eae0d1841a752"), "info" : { "height" : [ "5' 11" ] } }
{ "_id" : ObjectId("581e641fac7eae0d1841a753"), "info" : { "height" : [ "5' 8" ] } }
{ "_id" : ObjectId("581e641fac7eae0d1841a754"), "info" : { } }
{ "_id" : ObjectId("581e641fac7eae0d1841a755"), "info" : { } }
{ "_id" : ObjectId("581e641fac7eae0d1841a756"), "info" : { "height" : [ "5' 6 1/2" ] } }
{ "_id" : ObjectId("581e641fac7eae0d1841a757"), "info" : { "height" : [ "5' 8" ] } }
{ "_id" : ObjectId("581e641fac7eae0d1841a758"), "info" : { } }
{ "_id" : ObjectId("581e641fac7eae0d1841a759"), "info" : { "height" : [ "193 cm" ] } }
{ "_id" : ObjectId("581e641fac7eae0d1841a75a"), "info" : { "height" : [ "5' 5" ] } }
```

To find that  $1312 = 346 + 966$  people are taller than 170 cms, we proceed in two steps :

- `db.runCommand( { count:'mp3000',`  
    `query: {`  
        `"info.height": { $gt: "170" },`  
        `"info.height" : /cm/}`  
    `})` **in order to count fields with regex /cm/, returns 346**
- `db.runCommand( { count:'mp3000',`  
    `query: {`  
        `"info.height": { $gt: "5' 7\"`  
        `"info.height" : /'}`  
    `})` **in order to count fields with regex /cm/, returns 966**

```
moriarty@221bbs: ~  
#>  
> db.runCommand( { count:'mp3000', query: { "info.height": { $gt: "170" }, "info.height" : /cm/ } } )  
{ "waitedMS" : NumberLong(0), "n" : 346, "ok" : 1 }  
> db.runCommand( { count:'mp3000', query: { "info.height": { $gt: "5' 7\"  
{ "waitedMS" : NumberLong(0), "n" : 966, "ok" : 1 }  
>
```

6 - The query to find the word “Opera” in all subfields of the info subdocument is :

```
db.mp3000.find({$where: function() { for (var field in this.info) { for (var iter =  
0; iter < this.info[field].length; iter++ ) { if(this.info[field][iter].includes("Opera") ||  
this.info[field].includes("Opera")) return true; } } return false; }}, {"person-name":1})
```

```
moriarty@221bbs: ~ 151x22  
#>  
{ id : ObjectId(581cd221ce677c1cac37f747), person-name : Bell, William J. }  
{ id : ObjectId(581cd221ce677c1cac37f74b), person-name : Griffin, Merv }  
{ id : ObjectId(581cd221ce677c1cac37f76a), person-name : Nixon, Agnes }  
{ id : ObjectId(581cd221ce677c1cac37f791), person-name : Flynn, Christopher }  
{ id : ObjectId(581cd221ce677c1cac37f796), person-name : Lang, Katherine Kelly }  
{ id : ObjectId(581cd221ce677c1cac37f7d0), person-name : Moss, Ronn }  
{ id : ObjectId(581cd221ce677c1cac37f7e5), person-name : Rolfe, James }  
{ id : ObjectId(581cd221ce677c1cac37f821), person-name : Davidson, Doug }  
{ id : ObjectId(581cd221ce677c1cac37f828), person-name : Braeden, Eric }  
{ id : ObjectId(581cd221ce677c1cac37f82e), person-name : Vaona, Federico }  
{ id : ObjectId(581cd221ce677c1cac37f83e), person-name : Wyndham, Victoria }  
{ id : ObjectId(581cd221ce677c1cac37f850), person-name : Hall, Deidre }  
{ id : ObjectId(581cd221ce677c1cac37f89b), person-name : Ashford, Matthew }  
{ id : ObjectId(581cd221ce677c1cac37f8b1), person-name : Linder, Kate }  
{ id : ObjectId(581cd221ce677c1cac37f8b3), person-name : Ripa, Kelly }  
{ id : ObjectId(581cd221ce677c1cac37f8b8), person-name : Mascolo, Joseph }  
{ id : ObjectId(581cd221ce677c1cac37f8b9), person-name : Sweeney, Alison }  
{ id : ObjectId(581cd221ce677c1cac37f8c3), person-name : Slezak, Erika }  
{ id : ObjectId(581cd221ce677c1cac37f8d1), person-name : Scott, Melody Thomas }  
{ id : ObjectId(581cd221ce677c1cac37f8d8), person-name : Case, Sharon }
```

7 – I couldn’t answer this question



# MongoDB replication

8 – In a first shell I create in /tmp directory, 3 subfolders mongo0, mongo1, mongo2, followed by :  
*mongod --dbpath ~/mongo1 --port 20000 --replSet “rs”*

```
root@221bbs: /tmp# mkdir mongo0 mongo1 mongo2
root@221bbs: /tmp# mongod --dbpath /tmp/mongo0 --port 20000 --replSet "rs"
2016-11-07T22:37:00.349+0100 I CONTROL [initandlisten] MongoDB starting : pid=10777 port=20000 dbpath=/tmp/mongo0 64-bit host=221bbs
2016-11-07T22:37:00.349+0100 I CONTROL [initandlisten] db version v3.2.10
2016-11-07T22:37:00.349+0100 I CONTROL [initandlisten] git version: 79d9b3ab5ce20f51c272b4411202710a082d0317
2016-11-07T22:37:00.349+0100 I CONTROL [initandlisten] OpenSSL version: OpenSSL 1.0.2g 1 Mar 2016
2016-11-07T22:37:00.349+0100 I CONTROL [initandlisten] allocator: tcmalloc
2016-11-07T22:37:00.349+0100 I CONTROL [initandlisten] modules: none
2016-11-07T22:37:00.349+0100 I CONTROL [initandlisten] build environment:
2016-11-07T22:37:00.349+0100 I CONTROL [initandlisten] distarch: x86_64
2016-11-07T22:37:00.349+0100 I CONTROL [initandlisten] create target arch: x86_64
2016-11-07T22:37:00.349+0100 I CONTROL [initandlisten] options: { net: { port: 20000 }, replication: { replSet: "rs" }, storage: { dbPath: "/tmp/mongo0" } }
2016-11-07T22:37:00.371+0100 I STORAGE [initandlisten] wiredtiger_open config: create,cache size=4G,session max=20000,eviction=(threads_max=4),config base=false,statistics=(fast),log=(enabled=true,archive=true,path=journal,compressor=snappy),file_manager=(close_idle_time=100000),checkpoint=(wait=60,log size=2GB),statistics_log=(wait=0)
2016-11-07T22:37:00.390+0100 I CONTROL [initandlisten] ** WARNING: You are running this process as the root user, which is not recommended.
2016-11-07T22:37:00.390+0100 I CONTROL [initandlisten]
2016-11-07T22:37:00.390+0100 I CONTROL [initandlisten] ** WARNING: /sys/kernel/mm/transparent_hugepage/enabled is 'always'.
2016-11-07T22:37:00.391+0100 I CONTROL [initandlisten] We suggest setting it to 'never'
2016-11-07T22:37:00.391+0100 I CONTROL [initandlisten]
2016-11-07T22:37:00.391+0100 I CONTROL [initandlisten] ** WARNING: /sys/kernel/mm/transparent_hugepage/defrag is 'always'.
2016-11-07T22:37:00.391+0100 I CONTROL [initandlisten] We suggest setting it to 'never'
2016-11-07T22:37:00.391+0100 I CONTROL [initandlisten]
2016-11-07T22:37:00.395+0100 I REPL [initandlisten] Did not find local voted for document at startup; NoMatchingDocument: Did not find replica set
2016-11-07T22:37:00.395+0100 I REPL [initandlisten] lastVote document in local.replset.election
2016-11-07T22:37:00.395+0100 I REPL [initandlisten] Did not find local replica set configuration document at startup; NoMatchingDocument: Did not
2016-11-07T22:37:00.395+0100 I FTDC [initandlisten] find replica set configuration document in local.system.replset
2016-11-07T22:37:00.397+0100 I NETWORK [initandlisten] Initializing full-time diagnostic data capture with directory '/tmp/mongo0/diagnostic.data'
2016-11-07T22:37:00.397+0100 I NETWORK [initandlisten] waiting for connections on port 20000
2016-11-07T22:37:00.397+0100 I NETWORK [initandlisten] [HostnameCanonicalizationWorker] Starting hostname canonicalization worker
```

In three separate shells, port 21000 for mongo1 and 22000 for mongo 2 the result is :

```
root@221bbs: /tmp 151x14
2016-11-07T22:37:00.391+0100 I CONTROL [initandlisten] **
2016-11-07T22:37:00.391+0100 I CONTROL [initandlisten] We suggest setting it to 'never'
2016-11-07T22:37:00.391+0100 I REPL [initandlisten] Did not find local voted for document at startup; NoMatchingDocument: Did not find replica set
2016-11-07T22:37:00.395+0100 I REPL [initandlisten] lastVote document in local.replset.election
2016-11-07T22:37:00.395+0100 I REPL [initandlisten] Did not find local replica set configuration document at startup; NoMatchingDocument: Did not
2016-11-07T22:37:00.395+0100 I FTDC [initandlisten] find replica set configuration document in local.system.replset
2016-11-07T22:37:00.397+0100 I NETWORK [initandlisten] Initializing full-time diagnostic data capture with directory '/tmp/mongo0/diagnostic.data'
2016-11-07T22:37:00.397+0100 I NETWORK [initandlisten] waiting for connections on port 20000
2016-11-07T22:37:00.397+0100 I NETWORK [initandlisten] [HostnameCanonicalizationWorker] Starting hostname canonicalization worker

root@221bbs: ~ 151x14
2016-11-07T22:42:18.418+0100 I REPL [initandlisten] lastVote document in local.replset.election
2016-11-07T22:42:18.418+0100 I REPL [initandlisten] Did not find local replica set configuration document at startup; NoMatchingDocument: Did not
2016-11-07T22:42:18.419+0100 I FTDC [initandlisten] find replica set configuration document in local.system.replset
2016-11-07T22:42:18.419+0100 I NETWORK [initandlisten] Initializing full-time diagnostic data capture with directory '/tmp/mongo1/diagnostic.data'
2016-11-07T22:42:18.421+0100 I NETWORK [initandlisten] waiting for connections on port 21000

root@221bbs: /home/moriarty/tmp 151x14
2016-11-07T22:46:20.878+0100 I CONTROL [initandlisten] MongoDB starting : pid=4117 port=21000
2016-11-07T22:46:20.878+0100 I CONTROL [initandlisten] dbpath=/home/mouss/mongo2 64-bit host=mouss-UX303UA
2016-11-07T22:46:20.878+0100 I CONTROL [initandlisten] db version v3.4.0-rc2
2016-11-07T22:46:20.878+0100 I CONTROL [initandlisten] git version: 217b0e4d2b808fa45921e4ca1d73db32330620b
2016-11-07T22:46:20.878+0100 I CONTROL [initandlisten] OpenSSL version: OpenSSL 1.0.2g 1 Mar 2016
2016-11-07T22:46:20.878+0100 I CONTROL [initandlisten] allocator: tcmalloc
2016-11-07T22:46:20.878+0100 I CONTROL [initandlisten] modules: none
2016-11-07T22:46:20.878+0100 I CONTROL [initandlisten] build environment:
2016-11-07T22:46:20.878+0100 I CONTROL [initandlisten] distarch: x86_64
2016-11-07T22:46:20.878+0100 I CONTROL [initandlisten] create target arch: x86_64
2016-11-07T22:46:20.878+0100 I CONTROL [initandlisten] options: { net: { port: 21000 }, replication: { replSet: "rs" }, storage: { dbPath: "/home/mouss/mongo2" } }
2016-11-07T22:46:20.878+0100 I STORAGE [initandlisten] wiredtiger_open config: create,cache size=4G,session max=20000,eviction=(threads_max=4),config base=false,statistics=(fast),log=(enabled=true,archive=true,path=journal,compressor=snappy),file_manager=(close_idle_time=100000),checkpoint=(wait=60,log size=2GB),statistics_log=(wait=0)
2016-11-07T22:46:20.878+0100 I STORAGE [initandlisten] ** WARNING: Using the XFS filesystem is strongly recommended on the primary data file system.
2016-11-07T22:46:20.878+0100 I STORAGE [initandlisten] See http://docs.mongodb.org/manual/tutorial/convert-file-system-to-xfs/ for more details.
2016-11-07T22:46:20.878+0100 I STORAGE [initandlisten] ** WARNING: Access control is not enabled for the database.
2016-11-07T22:46:20.878+0100 I STORAGE [initandlisten] To enable access control, set the parameter accessControlMode to 'strict' in the configuration file and restart the server.
2016-11-07T22:46:20.878+0100 I STORAGE [initandlisten] ** WARNING: You are running this process as the root user, which is not recommended.
2016-11-07T22:46:20.878+0100 I STORAGE [initandlisten]
2016-11-07T22:46:20.878+0100 I STORAGE [initandlisten] ** WARNING: /sys/kernel/mm/transparent_hugepage/enabled is 'always'.
2016-11-07T22:46:20.878+0100 I STORAGE [initandlisten] We suggest setting it to 'never'
2016-11-07T22:46:20.878+0100 I STORAGE [initandlisten]
2016-11-07T22:46:20.878+0100 I STORAGE [initandlisten] ** WARNING: /sys/kernel/mm/transparent_hugepage/defrag is 'always'.
2016-11-07T22:46:20.878+0100 I STORAGE [initandlisten] We suggest setting it to 'never'
2016-11-07T22:46:20.878+0100 I STORAGE [initandlisten]
2016-11-07T22:46:20.878+0100 I REPL [initandlisten] Did not find local voted for document at startup; NoMatchingDocument: Did not find replica set
2016-11-07T22:46:20.878+0100 I REPL [initandlisten] lastVote document in local.replset.election
2016-11-07T22:46:20.878+0100 I REPL [initandlisten] Did not find local replica set configuration document at startup; NoMatchingDocument: Did not
2016-11-07T22:46:20.878+0100 I FTDC [initandlisten] find replica set configuration document in local.system.replset
2016-11-07T22:46:20.878+0100 I NETWORK [initandlisten] Initializing full-time diagnostic data capture with directory 'mongo2/diagnostic.data'
2016-11-07T22:46:20.878+0100 I NETWORK [initandlisten] waiting for connections on port 22000
2016-11-07T22:46:20.878+0100 I NETWORK [initandlisten] [HostnameCanonicalizationWorker] Starting hostname canonicalization worker
```

I will connect to mongo0 which open port is 20000 via the command :

*mongo localhost:20000*

For screening convenience, the remaining commands and std outputs are mentionned below

```

>rs.initiate()
{
  "info2" : "no configuration specified. Using a default configuration for the set",
  "me" : "221bbs:20000",
  "ok" : 1
}
>rs.add("221bbs:21000")
{ "ok" : 1 }
>rs.addArb("221bbs:22000")
{ "ok" : 1 }
>rs.status()
{
  "set" : "rs",
  "date" : ISODate("2016-11-07T22:08:22.657Z"),
  "myState" : 1,
  "term" : NumberLong(1),
  "heartbeatIntervalMillis" : NumberLong(2000),
  "optimes" : {
    "lastCommittedOpTime" : {
      "ts" : Timestamp(1478376501, 1),
      "t" : NumberLong(1)
    },
    "appliedOpTime" : {
      "ts" : Timestamp(1478376501, 1),
      "t" : NumberLong(1)
    },
    "durableOpTime" : {
      "ts" : Timestamp(1478376501, 1),
      "t" : NumberLong(1)
    }
  },
  "members" : [
    {
      "_id" : 0,
      "name" : "221bbs:20000",

```

```
"health" : 1,
"state" : 1,
"stateStr" : "PRIMARY",
"uptime" : 1495,
"optime" : {
  "ts" : Timestamp(1478376501, 1),
  "t" : NumberLong(1)
},
"optimeDate" : ISODate("2016-11-07T22:08:21Z"),
"electionTime" : Timestamp(1478556070, 1),
"electionDate" : ISODate("2016-11-05T19:44:30Z"),
"configVersion" : 5,
"self" : true
},
{
  "_id" : 1,
  "name" : "221bbs:21000",
  "health" : 1,
  "state" : 2,
  "stateStr" : "SECONDARY",
  "uptime" : 1396,
  "optime" : {
    "ts" : Timestamp(1478376491, 1),
    "t" : NumberLong(1)
  },
  "optimeDurable" : {
    "ts" : Timestamp(1478376491, 1),
    "t" : NumberLong(1)
  },
  "optimeDate" : ISODate("2016-11-07T22:08:11Z"),
  "optimeDurableDate" : ISODate("2016-11-07T22:08:11Z"),
  "lastHeartbeat" : ISODate("2016-11-07T22:08:20.731Z"),
  "lastHeartbeatRecv" : ISODate("2016-11-07T22:08:21.692Z"),
  "pingMs" : NumberLong(0),
  "syncingTo" : "221bbs:20000",
```

```

"configVersion" : 5
},
{
  "_id" : 2,
  "name" : "221bbs:22000",
  "health" : 1,
  "state" : 7,
  "stateStr" : "ARBITER",
  "uptime" : 1118,
  "lastHeartbeat" : ISODate("2016-11-07T22:08:20.727Z"),
  "lastHeartbeatRecv" : ISODate("2016-11-07T22:08:22.343Z"),
  "pingMs" : NumberLong(0),
  "syncingTo" : "221bbs:20000",
  "configVersion" : 5
}
],
"ok" : 1
}

```

Secondary server (mongo2) :

```

2016-11-07T22:45:06.323+0100 I NETWORK [thread1] connection accepted from 127.0.0.1:58030 #1 (1 connection
now open)
2016-11-07T22:45:06.323+0100 I - [conn1] end connection 127.0.0.1:58030 (1 connection now open)
2016-11-07T22:45:06.323+0100 I NETWORK [thread1] connection accepted from 127.0.0.1:58032 #2 (1 connection
now open)
2016-11-07T22:45:06.323+0100 I NETWORK [conn2] received client metadata from 127.0.0.1:58032 conn2:
{ driver: { name: "NetworkInterfaceASIO-Replication", version: "3.4.0-rc2" }, os: { type: "Linux", name: "Ubuntu",
architecture: "x86_64", version: "16.04" } }
2016-11-07T22:45:06.323+0100 I ASIO [NetworkInterfaceASIO-Replication-0] Connecting to moussUX303UA:20000
2016-11-07T22:45:06.324+0100 I ASIO [NetworkInterfaceASIO-Replication-0] Successfully connected to
moussUX303UA:20000
2016-11-07T22:45:06.325+0100 I NETWORK [thread1] connection accepted from 127.0.0.1:58038 #3 (2 connections
now open)
2016-11-07T22:45:06.325+0100 I - [conn3] end connection 127.0.0.1:58038 (2 connections now open)
2016-11-07T22:45:06.348+0100 I REPL [replExecDBWorker-2] Starting replication storage threads
2016-11-07T22:45:06.350+0100 I REPL [ReplicationExecutor] New replica set config in use: { _id: "rs", version:

```



2, protocolVersion: 1, members: [ { \_id: 0, host: "221bbs:20000", arbiterOnly: false, buildIndexes: true, hidden: false, priority: 1.0, tags: {}, slaveDelay: 0, votes: 1 }, { \_id: 1, host: "221bbs:21000", arbiterOnly: false, buildIndexes: true, hidden: false, priority: 1.0, tags: {}, slaveDelay: 0, votes: 1 } ], settings: { chainingAllowed: true, heartbeatIntervalMillis: 2000, heartbeatTimeoutSecs: 10, electionTimeoutMillis: 10000, catchUpTimeoutMillis: 2000, getLastErrorModes: {}, getLastErrorDefaults: { w: 1, wtimeout: 0 }, replicaSetId: ObjectId("581e369d7baaad2af290555") } }

2016-11-07T22:45:06.350+0100 I REPL [ReplicationExecutor] This node is 221bbs:21000 in the config

2016-11-07T22:45:06.350+0100 I REPL [ReplicationExecutor] transition to STARTUP2

2016-11-07T22:45:06.351+0100 I REPL [ReplicationExecutor] Member 221bbs:20000 is now in state PRIMARY

2016-11-07T22:45:06.421+0100 I REPL [initial sync-0] DataReplicator::\_anyActiveHandles\_inlock returned false as nothing is active.

2016-11-07T22:45:06.448+0100 I REPL [initial sync-0] sync source candidate: 221bbs:20000

2016-11-07T22:45:06.449+0100 I STORAGE [replication-0] dropAllDatabasesExceptLocal 1

2016-11-07T22:45:06.449+0100 I REPL [replication-0] \*\*\*\*\*

2016-11-07T22:45:06.449+0100 I REPL [replication-0] creating replication oplog of size: 1110MB...

2016-11-07T22:45:06.467+0100 I STORAGE [replication-0] Starting WiredTigerRecordStoreThread local.oplog.rs

2016-11-07T22:45:06.468+0100 I STORAGE [replication-0] The size storer reports that the oplog contains 0 records totaling to 0 bytes

2016-11-07T22:45:06.468+0100 I STORAGE [replication-0] Scanning the oplog to determine where to place markers for truncation

2016-11-07T22:45:06.519+0100 I REPL [replication-0] \*\*\*\*\*

2016-11-07T22:45:06.520+0100 I ASIO [NetworkInterfaceASIO-RS-0] Connecting to 221bbs:20000

2016-11-07T22:45:06.522+0100 I ASIO [NetworkInterfaceASIO-RS-0] Successfully connected to moussUX303UA:20000

2016-11-07T22:45:06.524+0100 I ASIO [NetworkInterfaceASIO-RS-0] Connecting to 221bbs:20000

2016-11-07T22:45:06.525+0100 I ASIO [NetworkInterfaceASIO-RS-0] Successfully connected to moussUX303UA:20000

2016-11-07T22:45:06.527+0100 I REPL [replication-1] CollectionCloner::start called, on ns:admin.system.version

2016-11-07T22:45:06.565+0100 I INDEX [InitialSyncInserters-admin.system.version0] build index on: admin.system.version properties: { v: 2, key: { version: 1 }, name: "incompatible\_with\_version\_32", ns: "admin.system.version" }

2016-11-07T22:45:06.565+0100 I INDEX [InitialSyncInserters-admin.system.version0] building index using bulk method

2016-11-07T22:45:06.584+0100 I INDEX [InitialSyncInserters-admin.system.version0] build index on: admin.system.version properties: { v: 1, key: { \_id: 1 }, name: "\_id\_", ns: "admin.system.version" }

2016-11-07T22:45:06.584+0100 I INDEX [InitialSyncInserters-admin.system.version0] building index using bulk method

2016-11-07T22:45:06.586+0100 I COMMAND [InitialSyncInserters-admin.system.version0] setting featureCompatibilityVersion to 3.4

2016-11-07T22:45:06.598+0100 I REPL [repl writer worker 15] data clone finished, status: OK

2016-11-07T22:45:06.599+0100 I REPL [replication-1] No need to apply operations. (currently at { : Timestamp 1478556106000|1 })

2016-11-07T22:45:06.600+0100 I REPL [initial sync-0] Initial sync attempt finishing up.

2016-11-07T22:45:06.601+0100 I REPL [initial sync-0] Initial Sync Statistics: { failedInitialSyncAttempts: 0, maxFailedInitialSyncAttempts: 10, initialSyncStart: new Date(1478556106350), initialSyncEnd: new Date(1478556106601), initialSyncElapsedMillis: 251, initialSyncAttempts: [ { durationMillis: 78, status: "OK", syncSource: "221bbs:20000" } ], fetchedMissingDocs: 0, appliedOps: 0, initialSyncOplogStart: Timestamp 1478556106000|1, initialSyncOplogEnd: Timestamp 1478556106000|1, databases: { databasesCloned: 1, admin: { collections: 1, clonedCollections: 1, start: new Date(1478556106526), end: new Date(1478556106598), elapsedMillis: 72, admin.system.version: { documentsToCopy: 1, documentsCopied: 1, indexes: 2, fetchedBatches: 1, start: new Date(1478556106527), end: new Date(1478556106598), elapsedMillis: 71 } } } }

2016-11-07T22:45:06.601+0100 I REPL [initial sync-0] DataReplicator::\_anyActiveHandles\_inlock returned false as nothing is active.

2016-11-07T22:45:06.601+0100 I REPL [initial sync-0] DataReplicator::\_anyActiveHandles\_inlock returned false as nothing is active.

2016-11-07T22:45:06.604+0100 I REPL [initial sync-0] initial sync done; took 0s.

2016-11-07T22:45:06.604+0100 I REPL [initial sync-0] Starting replication fetcher thread

2016-11-07T22:45:06.604+0100 I REPL [initial sync-0] Starting replication applier thread

2016-11-07T22:45:06.605+0100 I REPL [initial sync-0] Starting replication reporter thread

2016-11-07T22:45:06.605+0100 I REPL [rsBackgroundSync] could not find member to sync from

2016-11-07T22:45:06.605+0100 I REPL [rsSync] transition to RECOVERING

2016-11-07T22:45:06.606+0100 I REPL [rsSync] transition to SECONDARY