

MongoDB Replica Set Setup

Prerequisites:

Before running this script, ensure you have the following prerequisites met:

1. **Linux Environment:** This script is designed for a Linux-based operating system. It's been tested on Ubuntu but should work on other Debian-based distributions.
 2. **Root or Sudo Access:** You need root or sudo privileges to execute the installation and configuration steps.
 3. **Internet Connection:** Make sure your server has access to the internet to download required packages and MongoDB.
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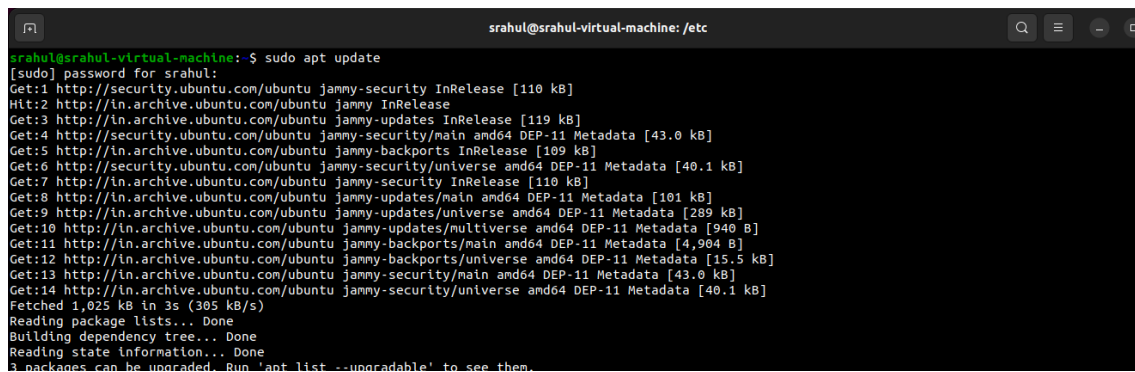
Script Explanation:

Now, let's break down the script into clear steps:

Step 1: Update System Packages

```
sudo apt update
```

- **Purpose:** Update the list of available software packages on your system.

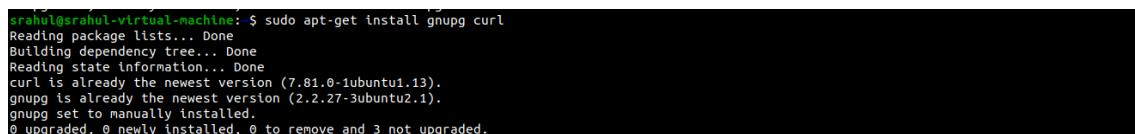
A terminal window titled 'srahul@srahul-virtual-machine: /etc' showing the output of the command 'sudo apt update'. The output lists various package sources and their metadata sizes, such as 'Get:1 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]' and 'Hit:2 http://in.archive.ubuntu.com/ubuntu jammy InRelease'. It concludes with 'Reading package lists... Done', 'Building dependency tree... Done', 'Reading state information... Done', and '3 packages can be upgraded. Run 'apt list --upgradable' to see them.'

```
srahul@srahul-virtual-machine:~$ sudo apt update
[sudo] password for srahul:
Get:1 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Hit:2 http://in.archive.ubuntu.com/ubuntu jammy InRelease
Get:3 http://in.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:4 http://security.ubuntu.com/ubuntu jammy-security/main amd64 DEP-11 Metadata [43.0 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease [109 kB]
Get:6 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 DEP-11 Metadata [40.1 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 DEP-11 Metadata [101 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 DEP-11 Metadata [289 kB]
Get:10 http://in.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 DEP-11 Metadata [940 B]
Get:11 http://in.archive.ubuntu.com/ubuntu jammy-backports/main amd64 DEP-11 Metadata [4,904 B]
Get:12 http://in.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 DEP-11 Metadata [15.5 kB]
Get:13 http://in.archive.ubuntu.com/ubuntu jammy-security/main amd64 DEP-11 Metadata [43.0 kB]
Get:14 http://in.archive.ubuntu.com/ubuntu jammy-security/universe amd64 DEP-11 Metadata [40.1 kB]
Fetched 1,025 kB in 3s (305 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
3 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

Step 2: Install Required Packages

```
sudo apt-get install -y gnupg curl
```

- **Purpose:** Install necessary packages `gnupg` and `curl` for handling MongoDB setup.

A terminal window titled 'srahul@srahul-virtual-machine:~\$' showing the output of the command 'sudo apt-get install -y gnupg curl'. The output indicates that 'curl' is already the newest version (7.81.0-1ubuntu1.13) and 'gnupg' is already the newest version (2.2.27-3ubuntu2.1). It concludes with 'gnupg set to manually installed.' and '0 upgraded, 0 newly installed, 0 to remove and 3 not upgraded.'

```
srahul@srahul-virtual-machine:~$ sudo apt-get install -y gnupg curl
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
curl is already the newest version (7.81.0-1ubuntu1.13).
gnupg is already the newest version (2.2.27-3ubuntu2.1).
gnupg set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 3 not upgraded.
```

Step 3: Add MongoDB GPG Key

```
curl -fsSL https://www.mongodb.org/static/pgp/server-5.0.asc | sudo gpg --dearmor -o /usr/share/keyrings/mongodb-archive-keyring.gpg
```

- **Purpose:** Download MongoDB's GPG key and store it in a secure location.

Step 4: Add MongoDB Repository

```
echo "deb [signed-by=/usr/share/keyrings/mongodb-archive-keyring.gpg] https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0 multiverse" | sudo tee /etc/apt/sources.list.d/mongodb-org-5.0.list
```

- **Purpose:** Add the MongoDB repository to your list of trusted software sources.

```
srahul@srahul-virtual-machine:~$ curl -fsSL https://pgp.mongodb.com/server-5.0.asc | \
  sudo gpg -o /usr/share/keyrings/mongodb-server-5.0.gpg \
  --dearmor
srahul@srahul-virtual-machine:~$ echo "deb [ arch=amd64,arm64 signed-by=/usr/share/keyrings/mongodb-server-5.0.gpg ] https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0 multiverse" | sudo tee /etc/apt/sources.list.d/mongodb-org-5.0.list
deb [ arch=amd64,arm64 signed-by=/usr/share/keyrings/mongodb-server-5.0.gpg ] https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0 multiverse
srahul@srahul-virtual-machine:~$ sudo apt-get update
Ign:1 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0 InRelease
Hit:2 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:3 http://in.archive.ubuntu.com/ubuntu jammy InRelease
Hit:4 http://in.archive.ubuntu.com/ubuntu jammy-updates InRelease
Get:5 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0 Release [3,094 B]
Hit:6 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:7 http://in.archive.ubuntu.com/ubuntu jammy-security InRelease
Get:8 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0 Release.gpg [866 B]
Get:9 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0/multiverse arm64 Packages [45.6 kB]
Get:10 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0/multiverse amd64 Packages [51.7 kB]
Fetched 101 kB in 2s (48.4 kB/s)
Reading package lists... Done
```

Step 5: Update System Packages Again

```
sudo apt-get update
```

- **Purpose:** Update the package list with the MongoDB repository included.

Step 6: Install libssl1.1 Package (Dependency for MongoDB)

```
wget http://archive.ubuntu.com/ubuntu/pool/main/o/openssl/libssl1.1_1.1.1f-1ubuntu2_amd64.deb
sudo dpkg -i libssl1.1_1.1.1f-1ubuntu2_amd64.deb
```

- **Purpose:** Download and install libssl1.1, a library MongoDB depends on.

```
srahul@srahul-virtual-machine:~$ wget http://archive.ubuntu.com/ubuntu/pool/main/o/openssl/libssl1.1_1.1.1f-1ubuntu2_amd64.deb
--2023-09-01 18:32:14-- http://archive.ubuntu.com/ubuntu/pool/main/o/openssl/libssl1.1_1.1.1f-1ubuntu2_amd64.deb
Resolving archive.ubuntu.com (archive.ubuntu.com)... 185.125.190.39, 185.125.190.36, 91.189.91.83, ...
Connecting to archive.ubuntu.com (archive.ubuntu.com)|185.125.190.39|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1318204 (1.3M) [application/x-debian-package]
Saving to: 'libssl1.1_1.1.1f-1ubuntu2_amd64.deb'

libssl1.1_1.1.1f-1u 100%[=====] 1.26M 987KB/s in 1.3s

2023-09-01 18:32:16 (987 KB/s) - 'libssl1.1_1.1.1f-1ubuntu2_amd64.deb' saved [1318204/1318204]

srahul@srahul-virtual-machine:~$ sudo dpkg -i libssl1.1_1.1.1f-1ubuntu2_amd64.deb
Selecting previously unselected package libssl1.1:amd64.
(Reading database ... 202170 files and directories currently installed.)
Preparing to unpack libssl1.1_1.1.1f-1ubuntu2_amd64.deb ...
Unpacking libssl1.1:amd64 (1.1.1f-1ubuntu2) ...
Setting up libssl1.1:amd64 (1.1.1f-1ubuntu2) ...
Processing triggers for libc-bin (2.35-0ubuntu3.1) ...
```

Step 7: Install MongoDB and Configure

```
sudo apt-get install -y mongodb-org
sudo systemctl start mongod
sudo systemctl daemon-reload
sudo systemctl enable mongod
```

- **Purpose:** Install MongoDB, start its service, reload the configuration, and enable it to start automatically.

```
srahul@srahul-virtual-machine:~$ sudo systemctl start mongod
srahul@srahul-virtual-machine:~$ sudo systemctl daemon-reload
srahul@srahul-virtual-machine:~$ sudo systemctl status mongod
● mongod.service - MongoDB Database Server
   Loaded: loaded (/lib/systemd/system/mongod.service; disabled; vendor prese
   Active: active (running) since Fri 2023-09-01 18:41:29 IST; 21s ago
     Docs: https://docs.mongodb.org/manual
   Main PID: 4605 (mongod)
    Memory: 65.8M
       CPU: 294ms
    CGroup: /system.slice/mongod.service
            └─4605 /usr/bin/mongod --config /etc/mongod.conf

Sep 01 18:41:29 srahul-virtual-machine systemd[1]: Started MongoDB Database Ser
Sep 01 18:41:29 srahul-virtual-machine mongod[4605]: {"t":{"$date":"2023-09-01T
^X
[1]+  Stopped                  sudo systemctl status mongod
srahul@srahul-virtual-machine:~$ sudo systemctl enable mongod
Created symlink /etc/systemd/system/multi-user.target.wants/mongod.service → /lib/systemd/system/mongod.service.
```

```
srahul@srahul-virtual-machine:~$ sudo apt-get install -y mongodb-org
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  mongodb-database-tools mongodb-mongosh mongodb-org-database
  mongodb-org-database-tools-extra mongodb-org-mongos mongodb-org-server
  mongodb-org-shell mongodb-org-tools
The following NEW packages will be installed:
  mongodb-database-tools mongodb-mongosh mongodb-org mongodb-org-database
  mongodb-org-database-tools-extra mongodb-org-mongos mongodb-org-server
  mongodb-org-shell mongodb-org-tools
0 upgraded, 9 newly installed, 0 to remove and 3 not upgraded.
Need to get 156 MB of archives.
After this operation, 449 MB of additional disk space will be used.
Get:1 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0/multiverse amd64 mongodb-database-tools amd64 100.8.0 [50.8 MB]
Get:2 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0/multiverse amd64 mongodb-mongosh amd64 1.10.6 [44.7 MB]
Get:3 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0/multiverse amd64 mongodb-org-shell amd64 5.0.20 [14.8 MB]
Get:4 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0/multiverse amd64 mongodb-org-server amd64 5.0.20 [26.6 MB]
Get:5 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0/multiverse amd64 mongodb-org-mongos amd64 5.0.20 [18.8 MB]
Get:6 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0/multiverse amd64 mongodb-org-database-tools-extra amd64 5.0.20 [7,756 B]
Get:7 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0/multiverse amd64 mongodb-org-database amd64 5.0.20 [3,544 B]
Get:8 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0/multiverse amd64 mongodb-org-tools amd64 5.0.20 [2,900 B]
Get:9 https://repo.mongodb.org/apt/ubuntu focal/mongodb-org/5.0/multiverse amd64 mongodb-org amd64 5.0.20 [2,932 B]
Fetched 156 MB in 29s (5,290 kB/s)
Selecting previously unselected package mongodb-database-tools.
(Reading database ... 202180 files and directories currently installed.)
Preparing to unpack .../0-mongodb-database-tools_100.8.0_amd64.deb ...
Unpacking mongodb-database-tools (100.8.0) ...
Selecting previously unselected package mongodb-mongosh.
Preparing to unpack .../1-mongodb-mongosh_1.10.6_amd64.deb ...
Unpacking mongodb-mongosh (1.10.6) ...
Selecting previously unselected package mongodb-org-shell.
Preparing to unpack .../2-mongodb-org-shell_5.0.20_amd64.deb ...
Unpacking mongodb-org-shell (5.0.20) ...
Selecting previously unselected package mongodb-org-server.
Preparing to unpack .../3-mongodb-org-server_5.0.20_amd64.deb ...
Unpacking mongodb-org-server (5.0.20) ...
Selecting previously unselected package mongodb-org-mongos.
Preparing to unpack .../4-mongodb-org-mongos_5.0.20_amd64.deb ...
Unpacking mongodb-org-mongos (5.0.20) ...
Selecting previously unselected package mongodb-org-database-tools-extra.
Preparing to unpack .../5-mongodb-org-database-tools-extra_5.0.20_amd64.deb ...
Unpacking mongodb-org-database-tools-extra (5.0.20) ...
Selecting previously unselected package mongodb-org-database.
Preparing to unpack .../6-mongodb-org-database_5.0.20_amd64.deb ...
Unpacking mongodb-org-database (5.0.20) ...
Selecting previously unselected package mongodb-org-tools.
Preparing to unpack .../7-mongodb-org-tools_5.0.20_amd64.deb ...
Unpacking mongodb-org-tools (5.0.20) ...
Selecting previously unselected package mongodb-org.
Preparing to unpack .../8-mongodb-org_5.0.20_amd64.deb ...
Unpacking mongodb-org (5.0.20) ...
Setting up mongodb-database-tools (100.8.0) ...
Setting up mongodb-mongosh (1.10.6) ...
Setting up mongodb-org-shell (5.0.20) ...
Setting up mongodb-org-server (5.0.20) ...
Setting up mongodb-org-mongos (5.0.20) ...
Setting up mongodb-org-database-tools-extra (5.0.20) ...
Setting up mongodb-org-database (5.0.20) ...
Setting up mongodb-org-tools (5.0.20) ...
Setting up mongodb-org (5.0.20) ...
```

Step 8: Create MongoDB Configuration for Replica Set

```
# ... (Configuration Details) ...
replication:
  replSetName: "rs0"
```

- **Purpose:** Create a configuration file specifying data path, port, and replication settings.

```
# for documentation of all options, see:
# Where and how to store data.
storage:
  dbPath: /var/lib/mongodb
```

```
journal:
  enabled: true
wiredTiger:
  engineConfig:
    cacheSizeGB: 1

# where to write logging data.
systemLog:
  destination: file
  logAppend: true
  path: /var/log/mongodb/mongod.log

# network interfaces
net:
  port: 27017
  bindIp: 127.0.0.1

# how the process runs
processManagement:
  timeZoneInfo: /usr/share/zoneinfo

# The following lines disable JavaScript execution.
security:
  javascriptEnabled: false
#operationProfiling:

replication:
  replSetName: "rs0"
```

Step 9: Start MongoDB with the New Configuration

```
sudo mongod --config /etc/mongod.conf
```

- **Purpose:** Start MongoDB using the newly created configuration file.

Step 10: Restart MongoDB

```
sudo systemctl restart mongod
```

- **Purpose:** Restart MongoDB to apply the changes.

Step 11: Start the First MongoDB Instance

```
sudo mongod --dbpath "/var/lib/mongodb" --logpath "/var/lib/mongodb/log/mongod.log" --
port 27017 --storageEngine=wiredTiger --wiredTigerCacheSizeGB 1 --journal --replSet
rs0 --noScripting
```

- **Purpose:** Launch the initial MongoDB instance with specific settings.

```

arahul@rahul-virtual-machine:~$ sudo mongod --dbpath "/var/lib/mongodb" --logpath "/var/lib/mongodb/log/mongod.log"
--port 27017 --storageEngine=wiredTiger --wiredTigerCacheSizeGB 1 --journal --replSet rs0 --noscripting
arahul@rahul-virtual-machine:~$ mongo --port 27017
MongoDB shell version v5.0.20
connecting to: mongodb://127.0.0.1:27017/?compressors=disabled&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("740d9490-1da4-433d-b0b4-df2db03a7b4d") }
MongoDB server version: 5.0.20
=====
Warning: the "mongo" shell has been superseded by "mongosh",
which delivers improved usability and compatibility. The "mongo" shell has been deprecated and will be removed in
an upcoming release.
For installation instructions, see
https://docs.mongodb.com/mongodb-shell/install/
=====
---
The server generated these startup warnings when booting:
  2023-09-01T20:04:46.580+05:30: Using the XFS filesystem is strongly recommended with the WiredTiger storage engine. See http:
odb.org/core/prodnotes-filesystem
  2023-09-01T20:04:46.994+05:30: Access control is not enabled for the database. Read and write access to data and configuratio
cted
---
> rsconf={_id:"rs0", members:[{_id:0,host:"localhost:27017"}]}
{
  "_id" : "rs0",
  "members" : [
    {
      "_id" : 0,
      "host" : "localhost:27017"
    }
  ]
}
> rs.initiate(rsconf)
{ "ok" : 1 }
rs0:SECONDARY>
rs0:PRIMARY> rs.status()

```

Step 12: MongoDB Shell and Initialize Replica Set

```
mongo --port 27017 --eval "..."
```

- **Purpose:** Use the MongoDB shell to set up the replica set configuration, add members, and an arbiter.

Step 13: Display Replica Set Status and Setup Completion Message

```
mongo --port 27017 --eval "rs.status()"
echo "MongoDB replica set setup is complete."
```

- **Purpose:** Check and display the status of the replica set and confirm the setup's completion.

```
rs0:PRIMARY> rs.status()
{
  "set" : "rs0",
  "date" : ISODate("2023-09-01T15:24:19.708Z"),
  "myState" : 1,
  "term" : NumberLong(1),
  "syncSourceHost" : "",
  "syncSourceId" : -1,
  "heartbeatIntervalMillis" : NumberLong(2000),
  "majorityVoteCount" : 1,
  "writeMajorityCount" : 1,
  "votingMembersCount" : 1,
  "writableVotingMembersCount" : 1,
  "optimes" : {
    "lastCommittedOpTime" : {
      "ts" : Timestamp(1693581849, 1),
      "t" : NumberLong(1)
    },
    "lastCommittedWallTime" : ISODate("2023-09-01T15:24:09.858Z"),
    "readConcernMajorityOpTime" : {
      "ts" : Timestamp(1693581849, 1),
      "t" : NumberLong(1)
    },
    "appliedOpTime" : {
      "ts" : Timestamp(1693581849, 1),
      "t" : NumberLong(1)
    },
    "durableOpTime" : {
      "ts" : Timestamp(1693581849, 1),
      "t" : NumberLong(1)
    },
    "lastAppliedWallTime" : ISODate("2023-09-01T15:24:09.858Z"),
    "lastDurableWallTime" : ISODate("2023-09-01T15:24:09.858Z")
  },
  "lastStableRecoveryTimestamp" : Timestamp(1693581849, 1),
```

This script automates the setup of a MongoDB replica set, ensuring MongoDB version 5.0, specific configurations, and multiple members, including an arbiter. It also disables JavaScript execution for enhanced security.

Ensure that you meet the prerequisites and run each step sequentially. This script simplifies the process of configuring MongoDB for replica sets, making it easier to manage and maintain a MongoDB cluster. Feel free to save this explanation as a PDF document for future reference

Created By- SR