



NoSQL DATABASE – Mongo DB: A Comprehensive Introduction and Step by Step Installation

Abstract

MongoDB is a cross-platform; document oriented database that provides, great performance, easy scalability, and high obtainability. MongoDB works on concepts such as, collection as well as on document. Mongo Database is precisely based on NoSQL Database concept. A NoSQL (initially referring to "not only SQL" or "non SQL" or "non-relational") database runs an appliance for storage and retrieval of data which is exhibited in means other than the regular tabular base relations used in relational DBS.

History of NoSQL

The term NoSQL was coined by Carlo Strozzi in the year of 1998, Strozzi NoSQL open-source relational DBS that did not interpretation the regular SQL interface, but was still relational. Furthermore, Strozzi put forward that, as the current NoSQL measure "advances from the relational model in all; it should consequently have been called more applicably 'No REL'", referring to 'No Relational'.

Johan Oskarsson introduce again the term NoSQL in the year of early 2009 when he systematized an event to talk over "open source scattered, non-relational databases". Grounded on 2014 proceeds, the NoSQL market leaders are Datastax, Mongo DB and Mark Logic. Founded on 2015 reputation positions, the most popular NoSQL databases are Apache Cassandra, Mongo Database, and Redis.

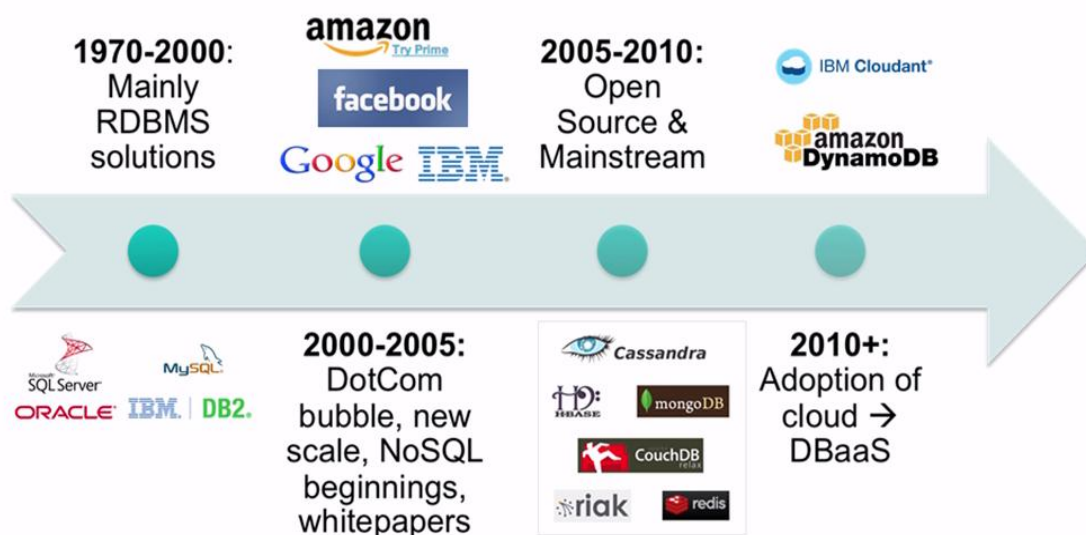


Figure 1: The rise of NoSQL and DBaaS

Mongo DB concepts

Database

Database is a physical container for collections. Each one database comes to be its own set of files on the local file system. A sole MongoDB server characteristically has multiple databases.

Collection

Collection is a cluster of MongoDB documents. It is the comparable of an RDBMS table. A collection is existent within a single database. Collections do not make compulsory a schema. Documents contained by a collection can have dissimilar fields. Usually, all documents in a collection are of analogous or related perseverance.

Document

A document is an established of key-value combines. Documents ought to dynamic representation. Dynamic representation means that documents in the similar collection do not need to have the equivalent set of structure or fields, and collective fields in a collection's documents might clench diverse types of data or data sets.

Below given table shows the relationship of RDBMS terminology with MongoDB

RDBMS	MongoDB
Database	Database
Table	Collection
Tuple/Row	Document
column	Field
Table Join	Embedded Documents
Primary Key	Primary Key (Default key <code>_id</code> provided by mongodb itself)
Database Server and Client	
Mysqld/Oracle	mongod
mysql/sqlplus	mongo

Figure 2: Relationship of RDBMS terminology with MongoDB

Features of MongoDB that makes it better among from other NoSQL Databases

- Document-Oriented storage- Document databases support querying more efficiently than other models
- Full Index Support – It supported full index so data retrieval process make faster
- Replication & High Availability- It supports high level of replication and also support big data model
- Auto-Sharding- MongoDB supports auto Sharding features which means user has no worry about data backup

- Querying- It produce fast result which will query by user online
- Fast In-Place Updates- MongoDB official site has produce full update time-to-time for up gradation and up-to-date features which tie up with the industrial aspect
- Map/Reduce- With the use of Map/Reduce features user can able to get the results from complex queries
- Easy to install and use- MongoDB install on many operating system on some operating system it support GUI so user can easily install and use it further
- Detailed documentation- It has detailed documentation which user can view anytime from mongodb.com
- Various APIs- It support various APIs
- Script Support- It supports so many scripting languages such as JavaScript, Python, Ruby, Perl
- Language Support- It supports languages or server side scripting such as PHP, Java, Scala, C#, C++, Haskell, Erlang
- Community- MongoDB has good documentation and free tutorials on the internet that all come in handy when learning MongoDB. StackOverflow and other open forum also has a good number of answered questions for MongoDB. This means you can easily find solutions to most of the challenges that you will face when developing applications.
- Open source- It is an open source so user can not worry about any licensing issues.

Where should we use MongoDB as a Database?

- Big Data
- Content Controlling and Delivery
- Mobile in addition to Social Infrastructure
- User Documents Management
- Data / Statistics Hub

Necessities to install MongoDB

There are no minimum requirements as such, but I wouldn't recommend running Mongo on the virtual machine or server.

Recommended Platforms

While MongoDB supports a variety of platforms, the following operating systems are recommended for production use:

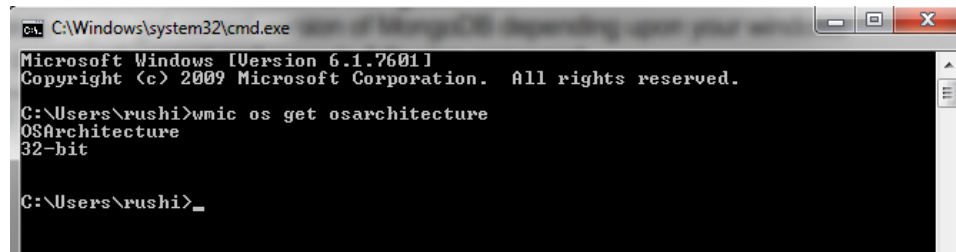
- Amazon Linux
- Debian 7.1
- CentOS 6.2+ / Red Hat EL
- SLES 11+
- Ubuntu LTS 14.04
- Ubuntu LTS 12.04
- Windows Server 2012 & 2012 R2

However user can able to install MongoDB on Windows 7, 8 as well as on Windows 10.

Install MongoDB On Windows

- To install the MongoDB on windows, first download the latest release of MongoDB from <http://www.mongodb.com/downloads>

- Make sure you get correct version of MongoDB depending upon your windows version.
- To get your windows based version open command prompt and execute following command
- Open cmd and execute as following



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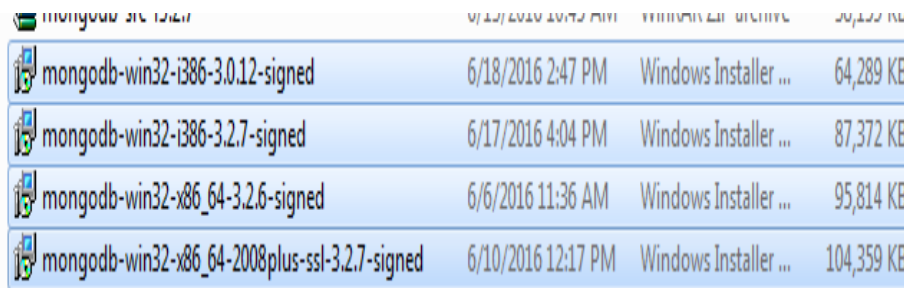
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\rushi>wmic os get osarchitecture
OSArchitecture
32-bit

C:\Users\rushi>_

```

- 32-bit versions of MongoDB only support databases lesser than 2-GB and apposite solitary for analysis, evaluation and testing determinations.
- Next extract your downloaded file to c:\ drive or any other location which you want to install on that particular drive.
- Make assured name of the extracted folder is mongodb-win32-i386-[version] or mongodb-win32-x86_64-[version].
- Here [version] is the version of MongoDB download.
- Diverse versions are available as following.



File Name	Date Modified	Type	Size
mongodb-win32-i386-3.0.12-signed	6/18/2016 2:47 PM	Windows Installer ...	64,289 KB
mongodb-win32-i386-3.2.7-signed	6/17/2016 4:04 PM	Windows Installer ...	87,372 KB
mongodb-win32-x86_64-3.2.6-signed	6/6/2016 11:36 AM	Windows Installer ...	95,814 KB
mongodb-win32-x86_64-2008plus-ssl-3.2.7-signed	6/10/2016 12:17 PM	Windows Installer ...	104,359 KB

Figure 3: Diverse versions for Mongo databases

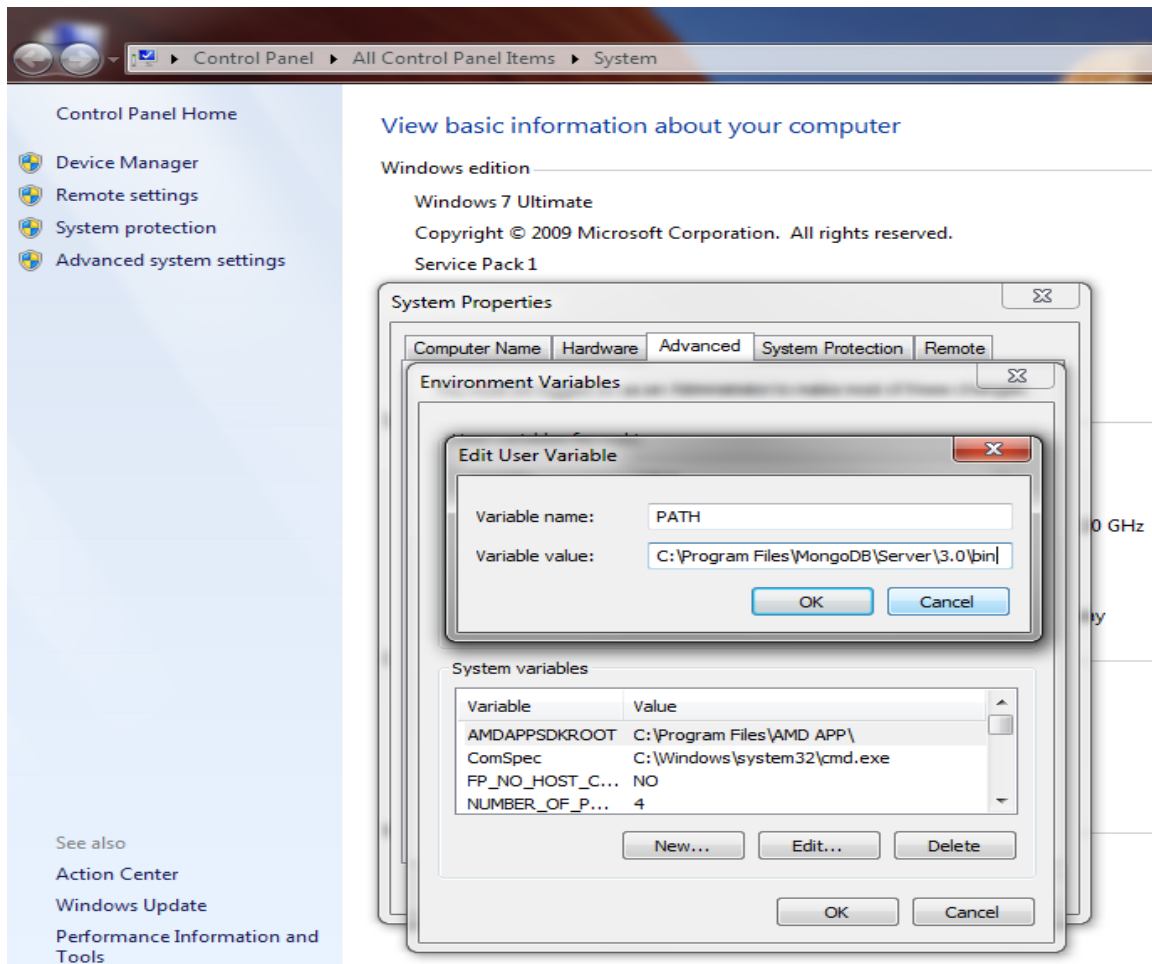
Once user can select appropriate version which is based upon their Operating System user can just execute that executable file on a local machine.

Setup steps for windows operating system

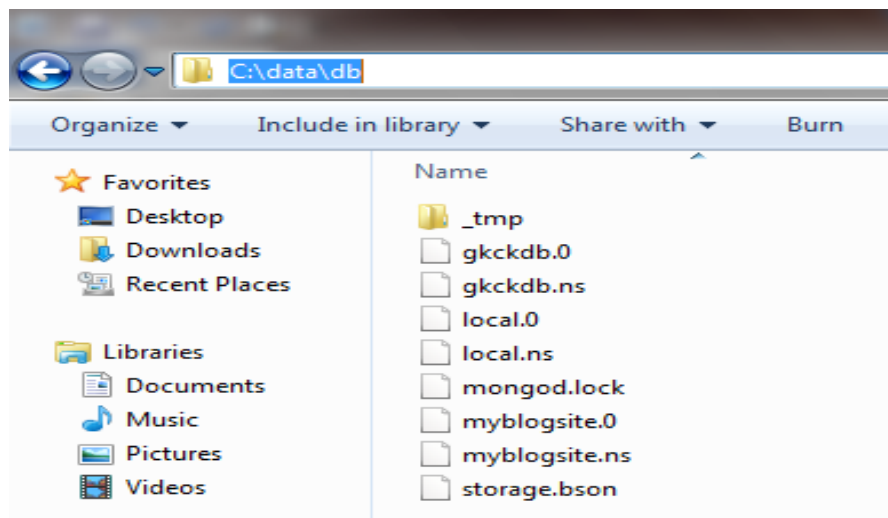
- Here I am using Windows 7 SP 1 Operating System
- 1) Click on mongodb-win32-i386-3.0.12-signed.msi which was download from <http://www.mongodb.org/downloads>
 - 2) Following screen will appear:



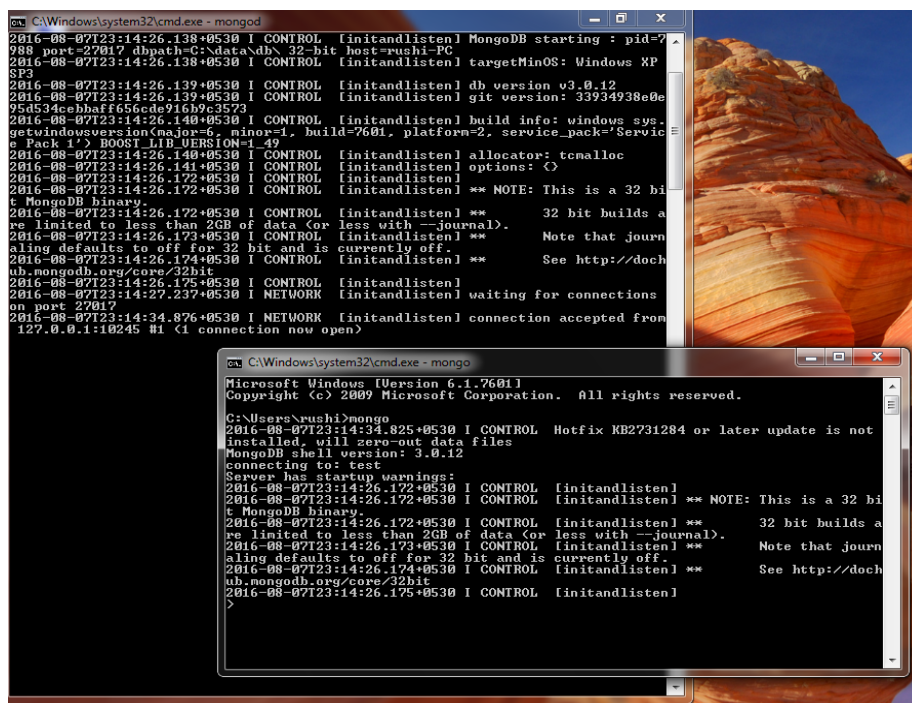
- 3) In next step, select complete option then press next.
- 4) If successfully mongo dB install then finish button will appear.
- 5) Next step is set environment variable with environment variable name as "PATH" and value as "C:\Program Files\MongoDB\Server\3.0\bin".



- 6) In next step, create a directory in C: or in installation drive (such as D: or E: drive letter), with name data under data directory also create one more directory with name db (like C:\data\db) for storage monog db database.



- 7) In last step you have to open two cmd from run and issue mongod command for open mongo db data server and in another cmd issue mongo command to connect mongo shell.



```

C:\Windows\system32\cmd.exe - mongod
2016-08-07T23:14:26.138+0530 I CONTROL [initandlisten] MongoDB starting : pid=988
2016-08-07T23:14:26.138+0530 I CONTROL [initandlisten] targetMinOS: Windows XP SP3
2016-08-07T23:14:26.139+0530 I CONTROL [initandlisten] db version v3.0.12
2016-08-07T23:14:26.139+0530 I CONTROL [initandlisten] git version: 33934938e0e95d534cebbaff656cde916b9c3573
2016-08-07T23:14:26.140+0530 I CONTROL [initandlisten] build info: windows sys.getwindowsversion(major=6, minor=1, build=7601, platform=2, service_pack='Service Pack 1') BOOST_LIB_VERSION=1_49
2016-08-07T23:14:26.140+0530 I CONTROL [initandlisten] allocator: tcmalloc
2016-08-07T23:14:26.141+0530 I CONTROL [initandlisten] options: {}
2016-08-07T23:14:26.172+0530 I CONTROL [initandlisten]
2016-08-07T23:14:26.172+0530 I CONTROL [initandlisten] ** NOTE: This is a 32 bit MongoDB binary.
2016-08-07T23:14:26.172+0530 I CONTROL [initandlisten] ** 32 bit builds are limited to less than 2GB of data (or less with --journal).
2016-08-07T23:14:26.173+0530 I CONTROL [initandlisten] ** Note that journaling defaults to off for 32 bit and is currently off.
2016-08-07T23:14:26.174+0530 I CONTROL [initandlisten] ** See http://docs.mongodb.org/core/32bit
2016-08-07T23:14:26.175+0530 I CONTROL [initandlisten]
2016-08-07T23:14:27.237+0530 I NETWORK [initandlisten] waiting for connections on port 27017
2016-08-07T23:14:34.876+0530 I NETWORK [initandlisten] connection accepted from 127.0.0.1:10245 #1 (1 connection now open)

C:\Windows\system32\cmd.exe - mongo
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\rushi>mongo
2016-08-07T23:14:34.825+0530 I CONTROL Hotfix KB2731284 or later update is not installed, will zero-out data files
MongoDB shell version: 3.0.12
connecting to: test
Server has startup warnings:
2016-08-07T23:14:26.172+0530 I CONTROL [initandlisten] ** NOTE: This is a 32 bit MongoDB binary.
2016-08-07T23:14:26.172+0530 I CONTROL [initandlisten] ** 32 bit builds are limited to less than 2GB of data (or less with --journal).
2016-08-07T23:14:26.173+0530 I CONTROL [initandlisten] ** Note that journaling defaults to off for 32 bit and is currently off.
2016-08-07T23:14:26.174+0530 I CONTROL [initandlisten] ** See http://docs.mongodb.org/core/32bit
2016-08-07T23:14:26.175+0530 I CONTROL [initandlisten]
>

```

- 8) If you are able to show above command prompt then you have completed mongo db installation in windows operating system platform.

Reference

- I. MongoDB the definitive guide - O'Reilly Kristina Chodorow & Michal Dirolf
- II. PHP and Mongo DB Web Development Beginners guide - Rubayeet Islam - Open Source
- III. <https://www.mongodb.com/> visited on 2nd September, 2016
- IV. <https://docs.mongodb.com/manual/> visited on 9th September, 2016
- V. <https://docs.mongodb.com/manual/installation/> visited on 9th September, 2016

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