

# Test system Build Diary

2021 R3 (V12 patch 27) MongoDB cluster implementation

## Disclaimer

This document is provided "as is" and is for your guidance and educational purposes only. It does not replace the Online documentation, nor is any warranty expressed nor implied for the steps described herein.

## Document Information

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## Introduction

### What is a "Build Diary"

A Build Diary simply describes the steps taken by Sage Support to perform a task or tasks on our internal test systems. Build diaries could be created for major multi-node installations, but may also just be describing the steps taken when installing a small hotfix, or anything in-between.

### Why is this being shared

It may be useful for you to see the steps we have taken to create or implement some feature or installation, as this may highlight "gotcha's", issues encountered or just give you some guidance if you are planning something similar yourself.

You could potentially use these documents as the base for your own "Workplan document" (Described in "Overview of patching X3 and supporting technologies" <https://www.sagecity.com/gb/sage-x3-uk/b/sage-x3-uk-support-insights/posts/sage-x3-technical-support-tips-and-tricks---march-2021-index> ) when you are planning your own activities

### Target Audience

This document is aimed at Sage X3 Certified Technical consultants. Sage prescribe that X3 system installation, maintenance, migrations, etc. should be performed by suitably qualified Sage X3 consultants. The prerequisite consideration would be for them to have the latest "Sage X3 Certified Technical Consultant" certification. You can read more about the Sage X3 qualifications and requirements in Sage University ( <https://sageu.csod.com/catalog/CustomPage.aspx?id=20000242#tc> )

### Additional things to note

- This document does NOT purport to illustrate "best practice" for the task being described
- The steps described will not necessarily be for a "perfect" task, as there may have been issues that needed to be overcome, worked around, or ignored
- The Sage internal test system has network and hardware configuration specific to Sage
- The Sage internal test system does not necessarily include a Windows Domain and has Sage sandbox specific Windows security setup, so operating system permissions are generally not discussed
- If you intend to use these notes as a guide for your own activities, use with caution and perform your own testing to ensure the described steps are suitable and identify any additional considerations that apply to your own situation
- Ensure you only install and use software you are licensed for

### What does this Build Diary describe?

This build diary primarily describes the implementation of a three-node MongoDB cluster. The starting point is a working single-node MongoDB installation, however the steps for a completely new install will be very similar.

## 2021 R3 – MongoDB Cluster build diary

### What is a MongoDB replica set

The MongoDB replica set provides resilience should the MongoDB service go down on one or more servers. One MongoDB instance is elected as the PRIMARY node, the others become secondary nodes that receive a copy of the data that is written to the primary. Three MongoDB nodes are minimum required for a replica set, although you can configure an “arbiter” process which reduces this requirement.

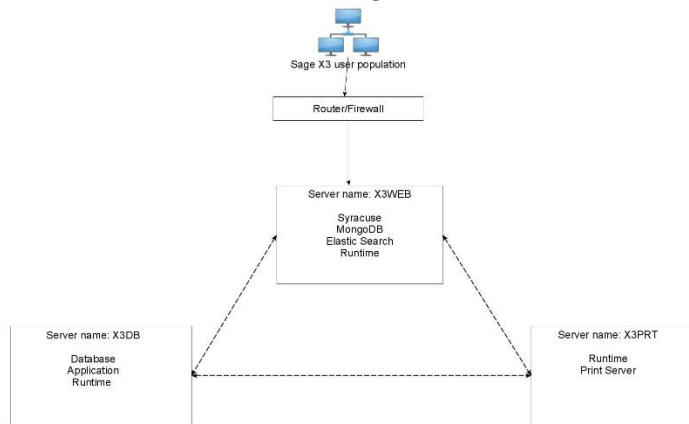
Further information on MongoDB Replica sets is at <https://docs.mongodb.com/v4.2/replication/> and tutorials are available at <https://docs.mongodb.com/v4.2/administration/replica-set-deployment/>

When installing Syracuse into an existing MongoDB replica set, it identifies this is the case and configures itself for a replica set automatically.

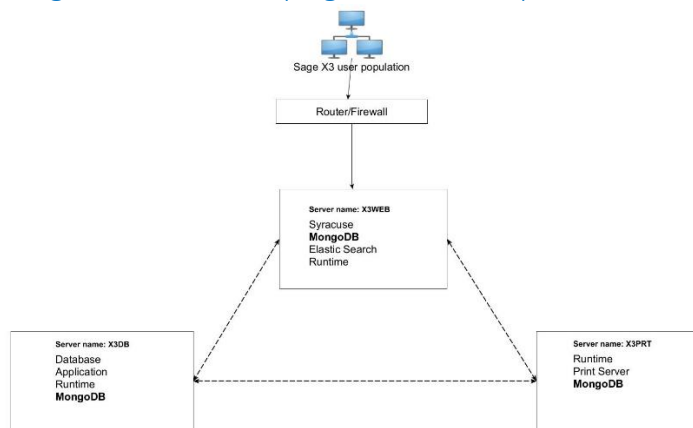
Steps to convert standalone to a replica set are listed at <https://docs.mongodb.com/v4.2/tutorial/convert-standalone-to-replica-set/index.html>

## Starting architecture and notes

Three Windows Server 2019 servers (Server names X3DB, X3WEB and X3PRT) There is currently a single standalone installation of MongoDB on the X3WEB server.



## Target architecture (Sage X3 2021 R3)



## Summary of components to install, per server

Sage X3 Runtime and Web Server (Server name X3WEB)

No new software install required

Database/Sage X3 Application/Runtime Server (Server name X3DB)

MongoDB

Sage X3 Runtime and Print Server (Server name X3PRT)

MongoDB

Documentation to use for planning and execution of this task

Sage Online documentation

Overall V12 documentation

<http://online-help.sageerpx3.com/erp/12/public/index.html>

Pre-requisites

[http://online-help.sageerpx3.com/erp/12/public/Prerequisites-\(Last-version\).html](http://online-help.sageerpx3.com/erp/12/public/Prerequisites-(Last-version).html)

[http://online-help.sageerpx3.com/erp/12/public/prerequisites\\_overview.html](http://online-help.sageerpx3.com/erp/12/public/prerequisites_overview.html)

Installation documentation

[http://online-help.sageerpx3.com/erp/12/public/getting-started\\_sage-erp-x3-installation-procedure.html](http://online-help.sageerpx3.com/erp/12/public/getting-started_sage-erp-x3-installation-procedure.html)

Sage Knowledgebase articles or Blogs

Which firewall ports need to be open in a multi-node environment

<https://support.na.sage.com/selfservice/viewdocument.do?externalId=102936>

“SSL certificates on Syracuse & MongoDB” presentation available from “Index page: Sage X3 Technical Support Tips and Tricks (September 2021)”

<https://www.sagecity.com/gb/sage-x3-uk/b/sage-x3-uk-support-insights/posts/index-page-sage-x3-technical-support-tips-and-tricks-september-2021>

Illustrated guide to setting up a (single) TEST server to use a MongoDB cluster

<https://www.sagecity.com/gb/sage-x3-uk/b/sage-x3-uk-support-insights/posts/illustrated-guide-to-setting-up-a-test-server-to-use-a-mongodb-cluster>

External sites (e.g. Microsoft, etc.)

*MongoDB*

<https://docs.mongodb.com/v4.2/replication/>

<https://docs.mongodb.com/v4.2/administration/replica-set-deployment/>

<https://docs.mongodb.com/v4.2/tutorial/convert-standalone-to-replica-set/index.html>

## Initial steps

Check the MongoDB version on the existing server X3WEB

Looking at the MongoDB log, I can see my MongoDB version is 4.2.12

```

mongoDB.log
1 2021-08-26T11:08:40.798+0100 W NETWORK [main] Mixing certs from the system certificate store and PEM files. This may produced unexpected results.
2 2021-08-26T11:08:41.321+0100 I CONTROL [main] Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'
3 2021-08-26T11:08:41.324+0100 W ASIO [main] No TransportLayer configured during NetworkInterface startup
4 2021-08-26T11:08:41.325+0100 I CONTROL [main] Trying to start Windows service 'MongoDB'
5 2021-08-26T11:08:41.326+0100 I CONTROL [initandlisten] MongoDB starting : pid=6728 port=27017 dbpath=D:\Sage\MongoDB\data 64-bit host=X3WEB
6 2021-08-26T11:08:41.326+0100 I CONTROL [initandlisten] targetMinOS: Windows 7/Windows Server 2008 R2
7 2021-08-26T11:08:41.327+0100 I CONTROL [initandlisten] db version v4.2.12
8 2021-08-26T11:08:41.327+0100 I CONTROL [initandlisten] git version: 5593fd8e33b60c75802edab304e23998fa0ce8a5
9 2021-08-26T11:08:41.327+0100 I CONTROL [initandlisten] allocator: tcmalloc
10 2021-08-26T11:08:41.327+0100 I CONTROL [initandlisten] modules: none
11 2021-08-26T11:08:41.327+0100 I CONTROL [initandlisten] build environment:
12 2021-08-26T11:08:41.327+0100 I CONTROL [initandlisten] distmod: 2012plus
  
```

Copy the same version of MongoDB software to the other two servers

I have copied MongoDB\_4.2.2.zip to “T:\Software\MongoDb” on my other two servers

Create SSL certificates required for the installation and copy to all servers

UKI Business Partners can obtain the SSL Certificate scripts used for this exercise from Sage X3 Support using GitHub. Otherwise, you can use your own scripts or certificate provider to generate the required certificates.

I have generated the scripts on X3PRT server in the “T:\mzCertificates” directory. This server already has OpenSSL installed, which the scripts use for certificate generation.

In directory “T:\mzCertificates\Mongo” edit then run the script “mzMongoDB\_Certs.cmd”

Change the SERVERNAMES line to list the three servers, X3WEB, X3DB and X3PRT.

**NOTE:** I need to regenerate certificates for ALL three servers, even for the existing MongoDB installation on X3WEB, as I need all three servers to use the same CA.

For each MongoDB server I need:

- Server certificate
- Private key
- .p12 file

I also need

- Certificate Authority certificate
- Client.crt, client.key and client.pem files

These files are all generated by my custom script:

shared (T:) > mzCertificates > Mongo > certs

Name	Date modified	Type	Size
ca.cacrt	05/10/2021 16:10	CACRT File	3 KB
client.crt	05/10/2021 16:10	Security Certificate	3 KB
client.key	05/10/2021 16:10	KEY File	4 KB
client.pem	05/10/2021 16:10	PEM File	6 KB
X3DB.crt	05/10/2021 16:10	Security Certificate	3 KB
X3DB.key	05/10/2021 16:10	KEY File	4 KB
X3DB.p12	05/10/2021 16:10	Personal Informati...	5 KB
X3DB.pem	05/10/2021 16:10	PEM File	6 KB
X3PRT.crt	05/10/2021 16:10	Security Certificate	3 KB
X3PRT.key	05/10/2021 16:10	KEY File	4 KB
X3PRT.p12	05/10/2021 16:10	Personal Informati...	5 KB
X3PRT.pem	05/10/2021 16:10	PEM File	6 KB
X3WEB.crt	05/10/2021 16:10	Security Certificate	3 KB
X3WEB.key	05/10/2021 16:10	KEY File	4 KB
X3WEB.p12	05/10/2021 16:10	Personal Informati...	5 KB
X3WEB.pem	05/10/2021 16:10	PEM File	6 KB

For simplicity, I will copy all these files into the “Documents” directory on each of my three servers, but will only use the ones appropriate for the specific server during the installation/update.



## Sage X3 Runtime and Web Server (Server name X3WEB)

Update firewall rules as per “Which firewall ports need to be open in a multi-node environment”

<https://support.na.sage.com/selfservice/viewdocument.do?externalId=102936>

Update X3WEB to allow the following ports from X3DB and X3PRT

TCP 27017 (MongoDB)

Shutdown Syracuse service

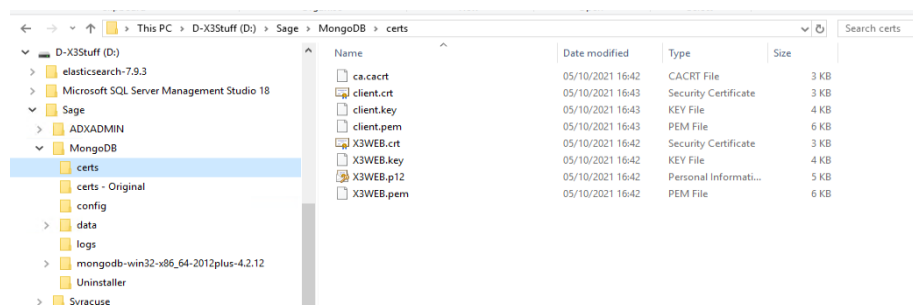
Update existing MongoDB installation to use the new SSL Certificates

Take backup of MongoDB data. For example, using MongoDump command

Shutdown MongoDB service

Archive the current mongod.log (optional)

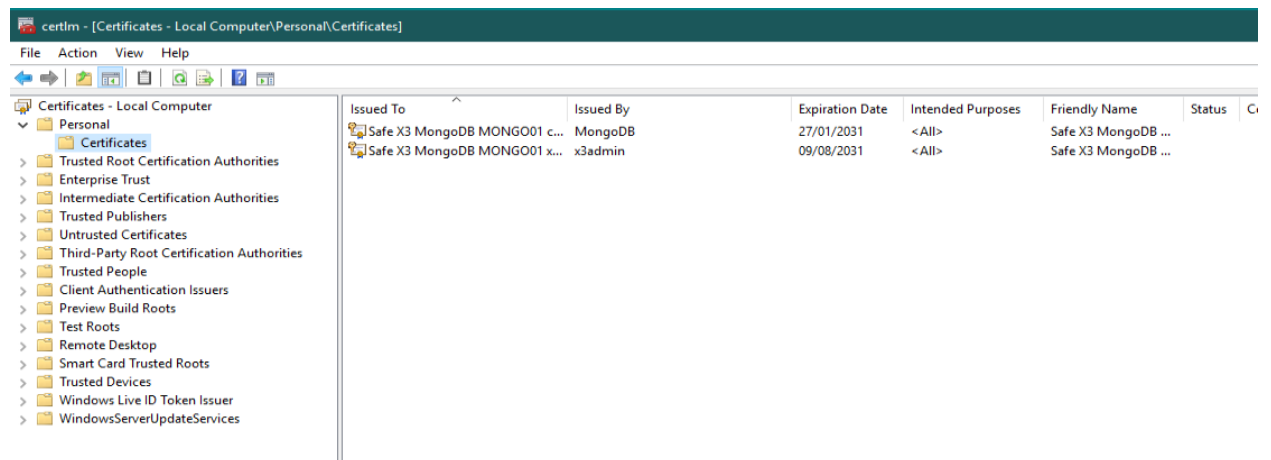
Replace the certificates located in “D:\Sage\MongoDB\certs” with the new certificates, currently located in “Documents” directory



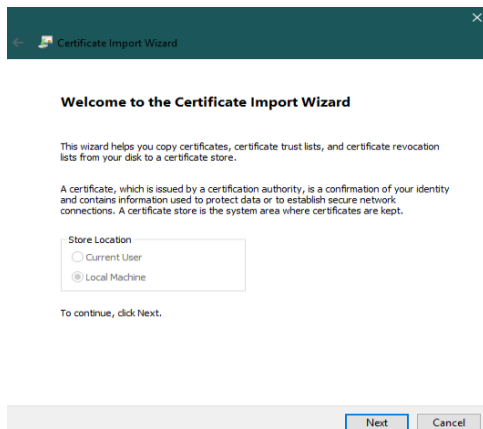
Update the Windows certificate store with the “X3WEB.p12” file. The simplest option may be to do this interactively using the Microsoft utility:

```
mmc.exe certlm.msc -s -r localMachine my
```

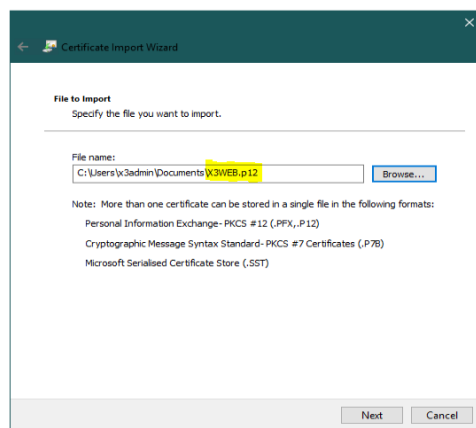
Navigate to Personal, Certificates



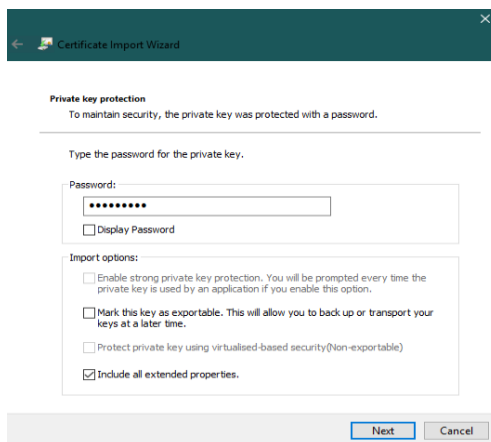
Right click on Certificate, then select “All tasks” and then “Import”



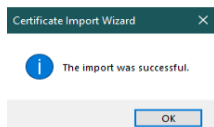
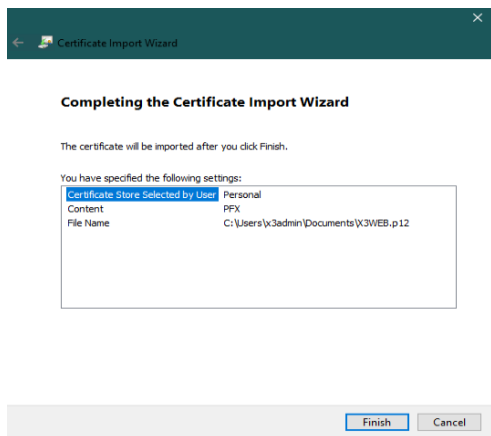
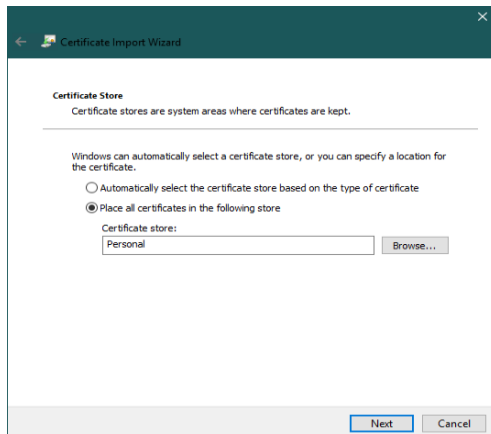
Ensure you select the “X3WEB.p12” file (it defaults to “.crt” files only!)



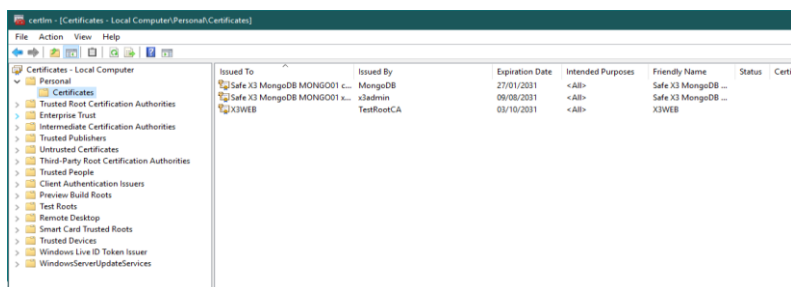
Enter the password



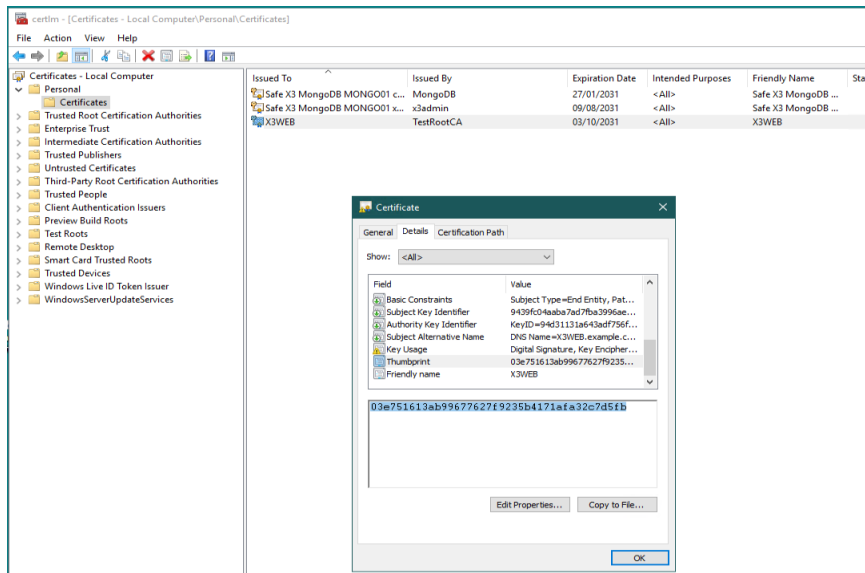
Click “Next”, then “Finish” to import the certificate



We can now see the newly imported certificate



Double click the new certificate, click the “Details” tab, then find the “Thumbprint” field. Note this value for the next step.



Edit the “mongod.conf” file, located in the “” directory. Replace the current “certificateSelector : thumbprint” value with the thumbprint from the new certificate.

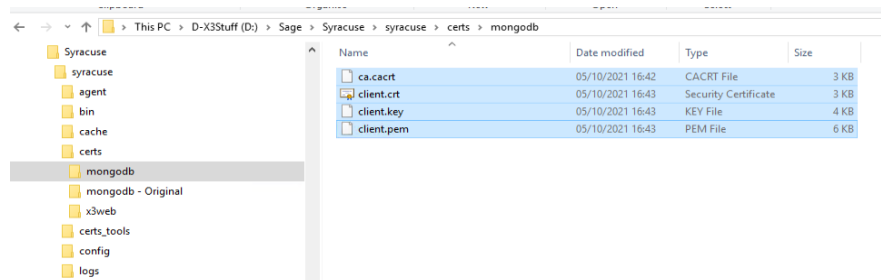
```

1 # For documentation of all options, see:
2 # http://docs.mongodb.org/manual/reference/configuration-options/
3
4 systemLog:
5   verbosity: 0
6   quiet: false
7   traceAllExceptions: false
8   path: "D:\\Sage\\MongoDB\\logs\\mongod.log"
9   logAppend: true
10  logRotate: rename
11  destination: file
12  timeStampFormat: iso8601-local
13
14 net:
15   bindIpAll: true
16   port: 27017
17   wireObjectCheck: true
18   ipv6: false
19   tls:
20     mode: requireTLS
21     CAFile: "D:\\Sage\\MongoDB\\certs\\ca.cacrt"
22     certificateSelector : thumbprint=03e751613ab99677627f9235b4171afa32c7d5f1b
23
24 security:
25   authorization: disabled
26   javascriptEnabled: true
27
28 operationProfiling:
29   slowOpThresholdMs: 2500
30
31 storage:
32   dbPath: "D:\\Sage\\MongoDB\\data"
33   indexBuildRetry: true
34   journal:
35     enabled: true
36   directoryPerDB: false
  
```

Restart MongoDB service. Check it starts OK, and that you can connect using Mongo shell.

## Update Syracuse certificates to use the new certificates

Replace the certificates located in “D:\Sage\Syracuse\syracuse\certs\mongodb” with the new certificates, currently located in “Documents” directory



## Test Syracuse still works

Restart Syracuse service and ensure it comes up correctly and you can login and access X3 normally

## Shutdown Syracuse service

## Create the MongoDB Replica Set

### Change mongodb.conf.

Add the following lines (note than Mongo is very fussy about spacing and line feeds)

```
replication:
  replSetName: X3
```

### Remove the line

```
indexBuildRetry: true
```

```

1 # for documentation of all options, see:
2 # http://docs.mongodb.org/manual/reference/configuration-options/
3
4 systemLog:
5   verbosity: 0
6   quiet: false
7   traceAllExceptions: false
8   path: "D:\Sage\MongoDB\logs\mongodb.log"
9   logAppend: true
10  logRotate: rename
11  destination: file
12  timeStampFormat: iso8601-local
13
14 net:
15   bindIpAll: true
16   port: 27017
17   wireObjectCheck: true
18   ipv6: false
19   tls:
20     mode: requireTLS
21     CAfile: "D:\Sage\MongoDB\certs\ca.cacrt"
22     certificateSelector : thumbprint=03e751613ab99677627f9235b4171afa32c7d5fb
23
24 security:
25   authorization: disabled
26   javascriptEnabled: true
27
28 operationProfiling:
29   slowOpThresholdms: 2500
30
31 storage:
32   dbPath: "D:\Sage\MongoDB\data"
33   journal:
34     enabled: true
35   directoryPerDB: false
36
37 replication:
38   replSetName: X3
39

```

## Restart MongoDB

Connect to mongo shell (use “mzMongoShell.cmd” script in “T:\SageSupport\InvestigationScripts\MongoDB”) and run:  
`rs.initiate()`

```

C:\Windows\system32\cmd.exe
2021-10-06T13:33:02.359+0100 W CONTROL [main] Option: ssl is deprecated. Please use tls instead.
2021-10-06T13:33:02.362+0100 W CONTROL [main] Option: sslPEMKeyFile is deprecated. Please use tlsCertificateKeyFile instead.
2021-10-06T13:33:02.362+0100 W CONTROL [main] Option: sslCAFile is deprecated. Please use tlsCAFile instead.
MongoDB shell version v4.2.12
connecting to: mongodb://X3WEB:27017/test?compressors=disabled&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("6cab35f1-8b9b-400d-ab3d-cc717c8af111") }
MongoDB server version: 4.2.12
---
Enable MongoDB's free cloud-based monitoring service, which will then receive and display
metrics about your deployment (disk utilization, CPU, operation statistics, etc).

The monitoring data will be available on a MongoDB website with a unique URL accessible to you
and anyone you share the URL with. MongoDB may use this information to make product
improvements and to suggest MongoDB products and deployment options to you.

To enable free monitoring, run the following command: db.enableFreeMonitoring()
To permanently disable this reminder, run the following command: db.disableFreeMonitoring()
---
> rs.initiate()
{
  "info2" : "no configuration specified. Using a default configuration for the set",
  "me" : "X3WEB:27017",
  "ok" : 1,
  "$clusterTime" : {
    "clusterTime" : Timestamp(1633523597, 1),
    "signature" : {
      "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA"),
      "keyid" : NumberLong(0)
    }
  },
  "operationTime" : Timestamp(1633523597, 1)
}
X3:SECONDARY>

```

The replica set is now operational, albeit not ready to accept connections just yet...

To view the replica set configuration, use “`rs.conf()`”

```

X3:SECONDARY> rs.conf()
{
  "_id" : "X3",
  "version" : 1,
  "protocolVersion" : NumberLong(1),
  "writeConcernMajorityJournalDefault" : true,
  "members" : [
    {
      "_id" : 0,
      "host" : "X3WEB:27017",
      "arbiterOnly" : false,
      "buildIndexes" : true,
      "hidden" : false,
      "priority" : 1,
      "tags" : {
      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    }
  ],
  "settings" : {
    "chainingAllowed" : true,
    "heartbeatIntervalMillis" : 2000,
    "heartbeatTimeoutSecs" : 10,
    "electionTimeoutMillis" : 10000,
    "catchUpTimeoutMillis" : -1,
    "catchUpTakeoverDelayMillis" : 30000,
    "getLastErrorModes" : {
    },
    "getLastErrorDefaults" : {
      "w" : 1,
      "wtimeout" : 0
    },
    "replicaSetId" : ObjectId("615d978d3b5d70fc8caaedaa")
  }
}
X3:PRIMARY>

```

To check the status of the replica set, use “rs.status()”

```

C:\Windows\system32\cmd.exe
"electionCandidateMetrics" : {
  "lastElectionReason" : "electionTimeout",
  "lastElectionDate" : ISODate("2021-10-06T12:33:17.584Z"),
  "electionTerm" : NumberLong(1),
  "lastCommittedOpTimeAtElection" : {
    "ts" : Timestamp(0, 0),
    "t" : NumberLong(-1)
  },
  "lastSeenOpTimeAtElection" : {
    "ts" : Timestamp(1633523597, 1),
    "t" : NumberLong(-1)
  },
  "numVotesNeeded" : 1,
  "priorityAtElection" : 1,
  "electionTimeoutMillis" : NumberLong(10000),
  "newTermStartDate" : ISODate("2021-10-06T12:33:17.614Z"),
  "wMajorityWriteAvailabilityDate" : ISODate("2021-10-06T12:33:17.632Z")
},
"members" : [
  {
    "_id" : 0,
    "name" : "X3WEB:27017",
    "health" : 1,
    "state" : 1,
    "stateStr" : "PRIMARY",
    "uptime" : 136,
    "optime" : {
      "ts" : Timestamp(1633523667, 1),
      "t" : NumberLong(1)
    },
    "optimeDate" : ISODate("2021-10-06T12:34:27Z"),
    "syncingTo" : "",
    "syncSourceHost" : "",
    "syncSourceId" : -1,
    "infoMessage" : "could not find member to sync from",
    "electionTime" : Timestamp(1633523597, 2),
    "electionDate" : ISODate("2021-10-06T12:33:17Z"),
    "configVersion" : 1,
    "self" : true,
    "lastHeartbeatMessage" : ""
  }
],
"ok" : 1,
"$clusterTime" : {
  "clusterTime" : Timestamp(1633523667, 1),
  "signature" : {
    "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAA="),
    "keyId" : NumberLong(0)
  }
},
"operationTime" : Timestamp(1633523667, 1)
}
X3:PRIMARY>

```

X3WEB is showing as a PRIMARY node, which is what we expect to see at this stage.

We now need to add additional MongoDB nodes to the replica set

## Database/Sage X3 Application/Runtime Server (Server name X3DB)

Update firewall rules as per “Which firewall ports need to be open in a multi-node environment”

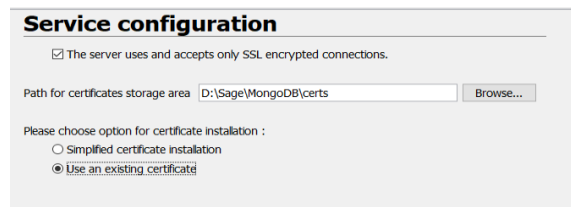
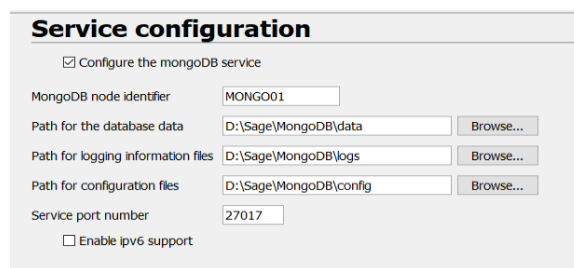
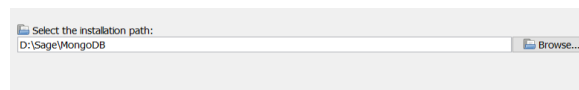
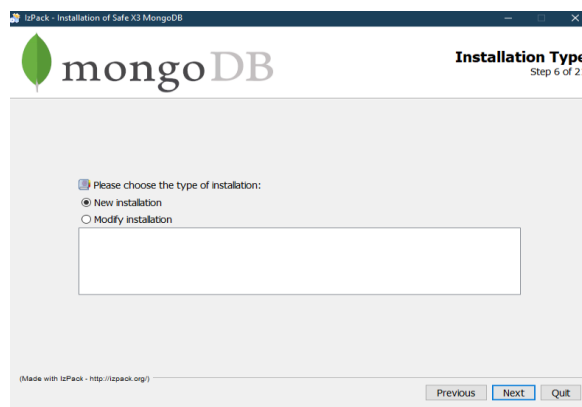
<https://support.na.sage.com/selfservice/viewdocument.do?externalId=102936>

Update X3DB to allow from X3WEB and X3PRT

TCP 27017 (MongoDB)

## Install MongoDB

Unzip “Mongoddb\_4.2.12.zip” then execute “mongo-db-4.2.12.10.jar” from directory “T:\Software\MongoDb” to run the installer.



Pick the new certificates from the “Documents” directory



### Use existing certificate

(\*) The setup may copy all required files into the directory "D:\Sage\MongoDB\certs"

Certificate file

Private key file

If the Server Private Key is encrypted with a passphrase then type it in this field. Be warned that in order to be launched as a service this passphrase need to be in clear text in the configuration file.

Passphrase if any

Set Up mongod and mongos with Certificate Validation

CA certificate file

### mongoDB Summary Configuration Data

Step 18 of 21

Installation will proceed with the following settings. Press Next to continue.

**Installation Type**  
New installation

**Installation Path**  
D:\Sage\MongoDB

**Chosen Installation Packs**  
Core files for Windows x86\_64 (2008.7 and newer)  
Configuration files  
Windows service control files

**Service creation**  
mongod.service.creation=true  
component.name=MONGOD1  
mongod.dir.dpath=D:\Sage\MongoDB\data  
mongod.dir.logpath=D:\Sage\MongoDB/logs  
mongod.dir.configpath=D:\Sage\MongoDB/config  
mongod.service.port=27017  
mongod.net.ipv6=false

**Service creation**  
mongod.ssl.enable=true  
mongod.dir.certs=D:\Sage\MongoDB/certs

(Made with IzPack - <http://izpack.org/>)

Check the messages to ensure no errors and that the service started OK

### mongoDB Perform External Processes

Step 20 of 21

#### Processing

4 / 4

```

PSParentPath: Microsoft.PowerShell.Security\Certificate::LocalMachine\my

Thumbprint                               Subject
-----
E6C8AC63D6816C69E2ABA6055E1EA5BA241CAEE9  CN=X3DB, L=Winnersh, S=Berkshire, OU=UK, O=Sage UK L

Service creation ...
Service start ...
The Safe X3 MongoDB MONGOD1 service is starting.
The Safe X3 MongoDB MONGOD1 service was started successfully.

Wait 10 s service starting ...

```

(Made with IzPack - <http://izpack.org/>)

Shutdown MongoDB service

Empty the "D:\Sage\MongoDB\data" directory (leave the directory itself behind)

Change mongod.conf.

Add the following lines (note than Mongo is very fussy about spacing and line feeds)

```

replication:
  replSetName: X3

```

Remove the line

```

indexBuildRetry: true

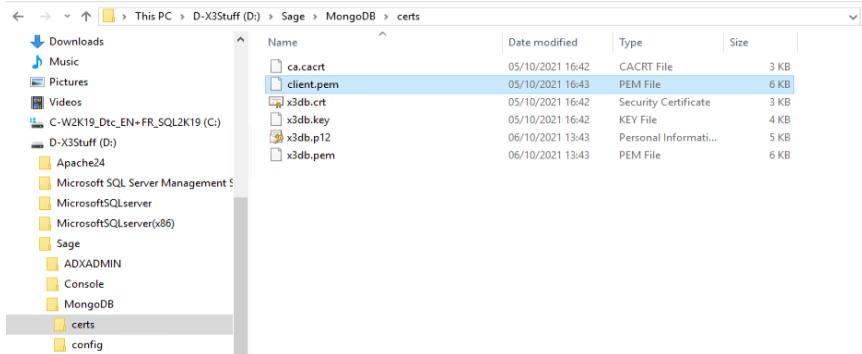
```

```

1 # for documentation of all options, see:
2 # http://docs.mongodb.org/manual/reference/configuration-options/
3
4 systemLog:
5   verbosity: 0
6   quiet: false
7   traceAllExceptions: false
8   path: "D:\\Sage\\MongoDB\\logs\\mongodb.log"
9   logAppend: true
10  logRotate: rename
11  destination: file
12  timeStampFormat: iso8601-local
13
14 net:
15   bindIpAll: true
16   port: 27017
17   wireObjectCheck: true
18   ipv6: false
19   tls:
20     mode: requireTLS
21     CAFile: "D:\\Sage\\MongoDB\\certs\\ca.cacrt"
22     certificateSelector: thumbprint=e6c8ac63d6816c69e2aba6055e1ea5ba2416aee9
23
24 security:
25   authorization: disabled
26   javascriptEnabled: true
27
28 operationProfiling:
29   slowOpThresholdMs: 2500
30
31 storage:
32   dbPath: "D:\\Sage\\MongoDB\\data"
33   journal:
34     enabled: true
35     directoryPerDB: false
36
37 replication:
38   replSetName: X3

```

Copy "client.pem" file to "D:\\Sage\\MongoDB\\certs" directory, from the "Documents" directory.



Start MongoDB

On X3WEB server (The PRIMARY node), in mongo shell run the following command:

```

rs.add( { host: "X3DB:27017", priority: 0, votes: 0 } )
X3:PRIMARY> rs.add( { host: "X3DB:27017", priority: 0, votes: 0 } )
{
  "ok" : 1,
  "$clusterTime" : {
    "clusterTime" : Timestamp(1633524687, 1),
    "signature" : {
      "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA"),
      "keyId" : NumberLong(0)
    }
  },
  "operationTime" : Timestamp(1633524687, 1)
}
X3:PRIMARY>

```

rs.status() command now shows X3DB as a "SECONDARY"

```

C:\Windows\system32\cmd.exe
"members" : [
  {
    "_id" : 0,
    "name" : "X3WEB:27017",
    "health" : 1,
    "state" : 1,
    "stateStr" : "PRIMARY",
    "uptime" : 1202,
    "optime" : {
      "ts" : Timestamp(1633524740, 1),
      "t" : NumberLong(1)
    },
    "optimeDate" : ISODate("2021-10-06T12:52:20Z"),
    "syncingTo" : "",
    "syncSourceHost" : "",
    "syncSourceId" : -1,
    "infoMessage" : "",
    "electionTime" : Timestamp(1633523597, 2),
    "electionDate" : ISODate("2021-10-06T12:33:17Z"),
    "configVersion" : 2,
    "self" : true,
    "lastHeartbeatMessage" : ""
  },
  {
    "_id" : 1,
    "name" : "X3DB:27017",
    "health" : 1,
    "state" : 2,
    "stateStr" : "SECONDARY",
    "uptime" : 54,
    "optime" : {
      "ts" : Timestamp(1633524740, 1),
      "t" : NumberLong(1)
    },
    "optimeDurable" : {
      "ts" : Timestamp(1633524740, 1),
      "t" : NumberLong(1)
    },
    "optimeDate" : ISODate("2021-10-06T12:52:20Z"),
    "optimeDurableDate" : ISODate("2021-10-06T12:52:20Z"),
    "lastHeartbeat" : ISODate("2021-10-06T12:52:21.189Z"),
    "lastHeartbeatRecv" : ISODate("2021-10-06T12:52:20.503Z"),
    "pingMs" : NumberLong(0),
    "lastHeartbeatMessage" : "",
    "syncingTo" : "X3WEB:27017",
    "syncSourceHost" : "X3WEB:27017",
    "syncSourceId" : 0,
    "infoMessage" : "",
    "configVersion" : 2
  }
],
"ok" : 1,
"$clusterTime" : {
  "clusterTime" : Timestamp(1633524740, 1),
  "signature" : {
    "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA"),
    "keyId" : NumberLong(0)
  }
},
"operationTime" : Timestamp(1633524740, 1)
}
X3:PRIMARY>

```

## Sage X3 Runtime and Print Server (Server name X3PRT)

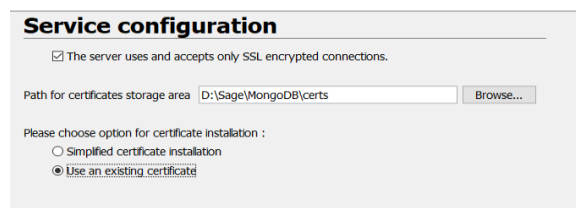
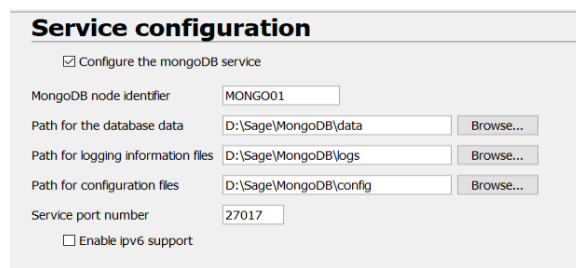
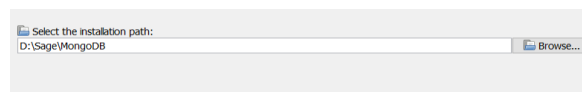
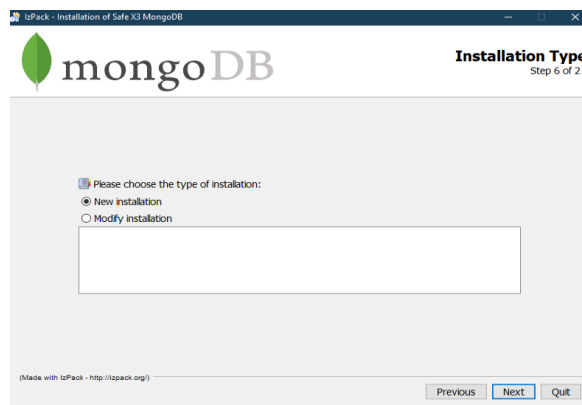
Update firewall rules as per “Which firewall ports need to be open in a multi-node environment”  
<https://support.na.sage.com/selfservice/viewdocument.do?externalId=102936>

Update X3PRT to allow from X3WEB and X3DB

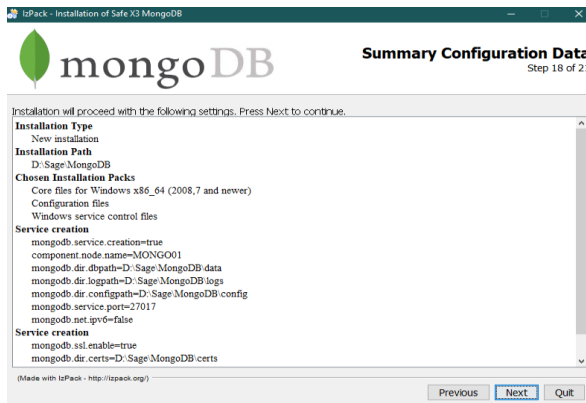
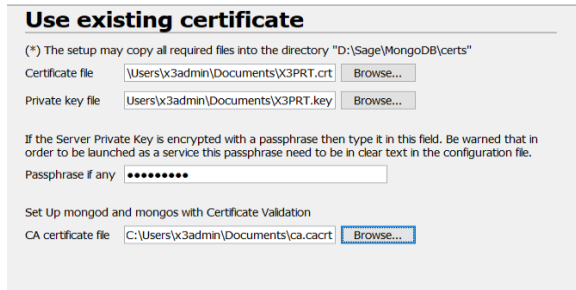
TCP 27017 (MongoDB)

### Install MongoDB

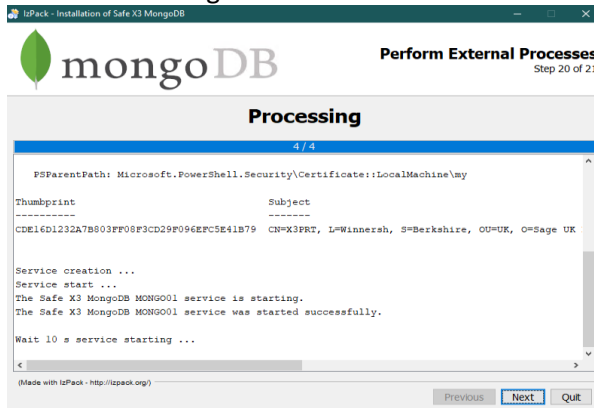
Unzip “Mongodb\_4.2.12.zip” then execute “mongo-db-4.2.12.10.jar” from directory  
 “T:\Software\MongoDb” to run the installer.



Pick the new certificates from the “Documents” directory



Check the messages to ensure no errors and that the service started OK



Shutdown MongoDB service

Empty the "D:\Sage\MongoDB\data" directory (leave the directory itself behind)

Change mongod.conf.

Add the following lines (note that Mongo is very fussy about spacing and line feeds)

```
replication:
  replSetName: X3
```

Remove the line

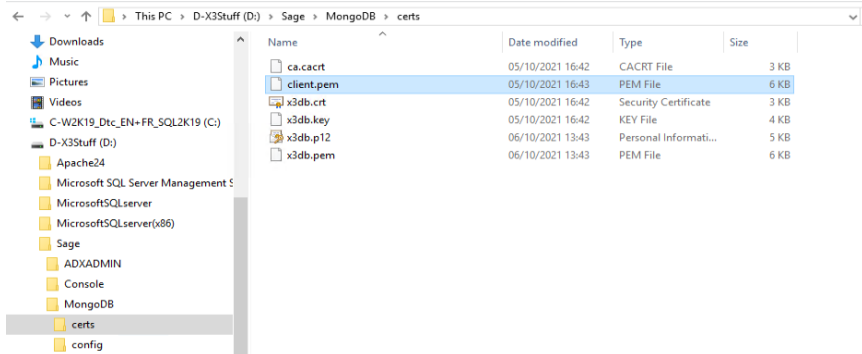
```
indexBuildRetry: true
```

```

1 # for documentation of all options, see:
2 # http://docs.mongodb.org/manual/reference/configuration-options/
3
4 systemLog:
5   verbosity: 0
6   quiet: false
7   traceAllExceptions: false
8   path: "D:\\Sage\\MongoDB\\logs\\mongodb.log"
9   logAppend: true
10  logRotate: rename
11  destination: file
12  timeStampFormat: iso8601-local
13
14 net:
15   bindIpAll: true
16   port: 27017
17   wireObjectCheck: true
18   ipv6: false
19   tls:
20     mode: requireTLS
21     CAFile: "D:\\Sage\\MongoDB\\certs\\ca.cacrt"
22     certificateSelector: thumbprint=e6c8ac63d6816c69e2aba6055e1ea5ba2416aee9
23
24 security:
25   authorization: disabled
26   javascriptEnabled: true
27
28 operationProfiling:
29   slowOpThresholdMs: 2500
30
31 storage:
32   dbPath: "D:\\Sage\\MongoDB\\data"
33   journal:
34     enabled: true
35     directoryPerDB: false
36
37 replication:
38   replSetName: X3

```

Copy “client.pem” file to “D:\Sage\MongoDB\certs” directory, from the “Documents” directory.



Start MongoDB

On X3WEB server (The PRIMARY node), in mongo shell run the following command:

```

rs.add( { host: "X3PRT:27017", priority: 0, votes: 0 } )
X3:PRIMARY> rs.add( { host: "X3PRT:27017", priority: 0, votes: 0 } )
{
  "ok" : 1,
  "$clusterTime" : {
    "clusterTime" : Timestamp(1633525355, 1),
    "signature" : {
      "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA"),
      "keyId" : NumberLong(0)
    }
  },
  "operationTime" : Timestamp(1633525355, 1)
}
X3:PRIMARY>

```

rs.status() command now shows X3PRT as a "SECONDARY"

```

C:\Windows\system32\cmd.exe
    },
    "t" : NumberLong(1)
  },
  "optimeDate" : ISODate("2021-10-06T13:02:57Z"),
  "optimeDurableDate" : ISODate("2021-10-06T13:02:57Z"),
  "lastHeartbeat" : ISODate("2021-10-06T13:03:05.491Z"),
  "lastHeartbeatRecv" : ISODate("2021-10-06T13:03:04.691Z"),
  "pingMs" : NumberLong(0),
  "lastHeartbeatMessage" : "",
  "syncingTo" : "X3WEB:27017",
  "syncSourceHost" : "X3WEB:27017",
  "syncSourceId" : 0,
  "infoMessage" : "",
  "configVersion" : 3
},
{
  "_id" : 2,
  "name" : "X3PRT:27017",
  "health" : 1,
  "state" : 2,
  "stateStr" : "SECONDARY",
  "uptime" : 30,
  "optime" : {
    "ts" : Timestamp(1633525377, 1),
    "t" : NumberLong(1)
  },
  "optimeDurable" : {
    "ts" : Timestamp(1633525377, 1),
    "t" : NumberLong(1)
  },
  "optimeDate" : ISODate("2021-10-06T13:02:57Z"),
  "optimeDurableDate" : ISODate("2021-10-06T13:02:57Z"),
  "lastHeartbeat" : ISODate("2021-10-06T13:03:05.603Z"),
  "lastHeartbeatRecv" : ISODate("2021-10-06T13:03:04.464Z"),
  "pingMs" : NumberLong(1),
  "lastHeartbeatMessage" : "",
  "syncingTo" : "X3DB:27017",
  "syncSourceHost" : "X3DB:27017",
  "syncSourceId" : 1,
  "infoMessage" : "",
  "configVersion" : 3
}
},
"ok" : 1,
"$clusterTime" : {
  "clusterTime" : Timestamp(1633525377, 1),
  "signature" : {
    "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA"),
    "keyId" : NumberLong(0)
  }
},
"operationTime" : Timestamp(1633525377, 1)
}
X3:PRIMARY>

```

## Finishing steps for MongoDB Replica Set

Once all three nodes are up and running, then run the following in the MongoDB shell (On the PRIMARY node) This next step setups up the newly added nodes to be able to convert to PRIMARY if there is a failover:

```

cfg = rs.conf()
cfg.members[1].priority=1
cfg.members[1].votes=1
cfg.members[2].priority=1
cfg.members[2].votes=1
rs.reconfig(cfg)

```

```

ReplicaSetId: ObjectId( '0130978d3b3d781e8baeadaa' )
}
X3:PRIMARY> cfg.members[1].priority=1
1
X3:PRIMARY> cfg.members[1].votes=1
1
X3:PRIMARY> cfg.members[2].priority=1
1
X3:PRIMARY> cfg.members[2].votes=1
1
X3:PRIMARY> rs.reconfig(cfg)
{
  "ok" : 1,
  "$clusterTime" : {
    "clusterTime" : Timestamp(1633525446, 1),
    "signature" : {
      "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA="),
      "keyId" : NumberLong(0)
    }
  },
  "operationTime" : Timestamp(1633525446, 1)
}
X3:PRIMARY>
X3:PRIMARY>

```



Use `rs.conf()` to check results.

```

C:\Windows\system32\cmd.exe
{
  "version" : 4,
  "protocolVersion" : NumberLong(1),
  "writeConcernMajorityJournalDefault" : true,
  "members" : [
    {
      "_id" : 0,
      "host" : "X3WEB:27017",
      "arbiterOnly" : false,
      "buildIndexes" : true,
      "hidden" : false,
      "priority" : 1,
      "tags" : {
      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    },
    {
      "_id" : 1,
      "host" : "X3DB:27017",
      "arbiterOnly" : false,
      "buildIndexes" : true,
      "hidden" : false,
      "priority" : 1,
      "tags" : {
      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    },
    {
      "_id" : 2,
      "host" : "X3PRT:27017",
      "arbiterOnly" : false,
      "buildIndexes" : true,
      "hidden" : false,
      "priority" : 1,
      "tags" : {
      },
      "slaveDelay" : NumberLong(0),
      "votes" : 1
    }
  ],
  "settings" : {
    "chainingAllowed" : true,
    "heartbeatIntervalMillis" : 2000,
    "heartbeatTimeoutSecs" : 10,
    "electionTimeoutMillis" : 10000,
    "catchUpTimeoutMillis" : -1,
    "catchUpTakeoverDelayMillis" : 30000,
    "getLastErrorModes" : {
    }
  },
  "getLastErrorDefaults" : {
    "w" : 1,
    "wtimeout" : 0
  },
  "replicaSetId" : ObjectId("615d978d3b5d70fc8caaedaa")
}
X3:PRIMARY>

```

All three “members” will now show with “priority” and “votes” set to a value of “1”

Now all three MongoDB servers are setup in a Replica Set.

One more thing to check before we move on is to confirm the “featureCompatibilityVersion” is set to “4.2” Use the command `db.adminCommand( { getParameter: 1, featureCompatibilityVersion: 1 } )`

```

X3:PRIMARY> db.adminCommand( { getParameter: 1, featureCompatibilityVersion: 1 } )
{
  "featureCompatibilityVersion" : {
    "version" : "4.2"
  },
  "ok" : 1,
  "$clusterTime" : {
    "clusterTime" : Timestamp(1633525817, 1),
    "signature" : {
      "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA"),
      "keyId" : NumberLong(0)
    }
  },
  "operationTime" : Timestamp(1633525817, 1)
}
X3:PRIMARY>

```

## Finishing off tasks

We have now completed the MongoDB setup, so the next step is to startup Syracuse and make sure everything looks OK.

The screenshot displays the Sage A/R Accounting Manager interface. The main content area is divided into two primary sections: 'CUSTOMERS EXCEEDING CREDIT LEV' and 'LATE CUSTOMER OPEN ITEMS'. Below these, there is a section for 'A/R ACCOUNTING MANAGER INDIC'.

**CUSTOMERS EXCEEDING CREDIT LEV** (67 Records, Page size: 10)

Company	Customer	Company Name	Authorized Credit	Global Credit	Delivery Credit	Shipped
AE10	AE001	Al Rostamani Communications	0	23 863.37		.01
AE10	AE002	Al Zahra Computers	0	716 625	0	
AE10	AE003	Cosmos Computer Co LLC	0	70 996.38	0	
AE020	AE006	Distribuidora do Caxito	0	1 494 350	0	
AU10	AU003	JB Lee	0	1 110	0	
AU10	AU003	JB Lee	0	33 903.66	731.1	
BE20	BE001	BE Concept	0	2 323.4	0	
BH10	BH001	Global Computers And Electronics	0	4 541.26	.02	
DE10	DE001	1 2 3 Rad GmbH	0	465 715.12	204.68	
DE10	DE002	Bike & Outdoor Company GmbH	0	129 983.95		

**LATE CUSTOMER OPEN ITEMS** (708 Records, Page size: 10)

Play-by BP	Company Name	Due date	Balance	Accounting currency	Site	Journal number
AE001	Al Rostamani Communications	27/02/2021	131.88	AED	AE011	SIN1901AE01100001
AE001	Al Rostamani Communications	02/03/2021	1 050	AED	AE011	SIN1901AE01100005
AE001	Al Rostamani Communications	13/03/2021	204.23	AED	AE011	SIN1902AE01100007
AE001	Al Rostamani Communications	19/07/2021	118.19	SAR	SA011	SA01119068VBC00000
AE002	Al Zahra Computers	28/01/2021	10 000	AED	AE011	SIN1901AE01100002
AE002	Al Zahra Computers	29/01/2021	18 375	AED	AE011	SIN1901AE01100003
AE003	Cosmos Computer Co LLC	29/01/2021	65.94	AED	AE011	SIN1901AE01100004
AE003	Cosmos Computer Co LLC	31/01/2021	2 000	AED	AE011	SIN1901AE01100006
AE001	Luanda BTI	03/08/2021	-400	EUR	PT031	PT0311708-BEC-000001
AE002	Ciclo Belas	11/02/2021	-74 426	AOA	AO011	AO0111602-BEC-00000

**A/R ACCOUNTING MANAGER INDIC**

A/R Accounting manager Indicators

- Unposted Sales Invoices
- Unposted Customer Receipts
- Unposted Prepayments

## Testing, testing, testing

Complete your testing, ensuring you try various failure scenarios to confirm it works as expected.

## Conclusion

This “Build diary” document provides a three-node MongoDB cluster implementation for informal testing.