aidev mongoDB MONITORING PLUG-IN FOR ORACLE ENTERPRISE MANAGER

SSL Configuration: an example

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This document details a walkthrough example of SSL configuration in an EM managed mongoDB environment.

SSL certificates are used to enforce certificate based security and network encryption.

ROOT KEY AND CA CERTIFICATE CREATION:

This will be used to sign the mongoDB and agent certificates.

For the mongoDB instance the trusted CA maps to the parameter *sslCAFile*.

```
mkdir /etc/ssl/mongo

cd /etc/ssl/mongo

openssl genrsa -out rootCA.key 4096
```

We now have a root key:

rootCA.key

Generate the root certificate (only required if you need a new one):

```
openssl req -x509 -new -nodes -key rootCA.key -days 3650 -out
rootCA.pem
```

```
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:UK
State or Province Name (full name) [Some-State]:
Locality Name (eg, city) []:
Organization Name (eg, company) [Internet Widgits Pty Ltd]:AIDEV UK
Organizational Unit Name (eg, section) []:
Common Name (e.g. server FQDN or YOUR name) []:AIDEV ROOT CA
Email Address []:info@aidev.uk
```

We also now have a root certificate and key:

rootCA.key
rootCA.pem

MONGO KEY AND CERTIFICATE CREATION

This will be used by the mongoDB instance and maps to the parameter *sslPEMKeyFile*.

IMPORTANT: PLEASE ENSURE THAT THE COMMON NAME MATCHES THE HOSTNAME OR IP ADDRESS OF THE MONGODB HOST.

```
openssl genrsa -out mongoDB.key 4096
```

```
openssl req -new -key mongoDB.key -out mongoDB.csr
```

```
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:GB
State or Province Name (full name) [Some-State]:
Locality Name (eg, city) []:
Organization Name (eg, company) [Internet Widgits Pty Ltd]:AIDEV UK
Organizational Unit Name (eg, section) []:
Common Name (e.g. server FQDN or YOUR name) []:192.168.0.51
Email Address []:info@aidev.uk

Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:welcome1
An optional company name []:
```

```
openssl x509 -req -in mongoDB.csr -CA rootCA.pem -CAkey rootCA.key
-CAcreateserial -out mongoDB.crt -days 3650
```

```
Signature ok
subject=/C=GB/ST=Some-State/O=AIDEV
UK/CN=osboxes/emailAddress=info@aidev.uk
Getting CA Private Key
```

For the mongoDB side, we now have:

mongoDB.crt
mongoDB.csr
mongoDB.key

AGENT KEY AND CERTIFICATE CREATION

This will be used by the EM agent.

```
openssl genrsa -out agent.key 4096
```

```
openssl req -new -key agent.key -out agent.csr
```

```
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:GB
State or Province Name (full name) [Some-State]:
Locality Name (eg, city) []:
Organization Name (eg, company) [Internet Widgits Pty Ltd]:AIDEV UK
Organizational Unit Name (eg, section) []:
Common Name (e.g. server FQDN or YOUR name) []:emcc.example.com
Email Address []:info@aidev.uk

Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:welcome1
An optional company name []:
```

```
openssl x509 -req -in agent.csr -CA rootCA.pem -CAkey rootCA.key -CAcreateserial -out agent.crt -days 3650
```

```
Signature ok
subject=/C=GB/ST=Some-State/O=AIDEV UK/CN=emcc.example.com/emailAddress=info@aidev.uk
Getting CA Private Key
```

For the agent side we now have:

agent.crt
agent.csr
agent.key

CONFIGURE MONGOD

Create the pem files for the agent and mongoDB:

cat mongoDB.key mongoDB.crt > mongoDB.pem

cat agent.key agent.crt > agent.pem

IMPORTANT: ensure the following files are chmod 600 by the mongoDB operating system user:

mongoDB.pem
rootCA.pem

Start mongo:

```
/root/mongo/mongodb-linux-x86_64-ubuntu1404-3.0.4/bin/mongod  \
--fork --rest --port 28001 \
--dbpath /data_new/db/ssl_01 \
--logpath /data_new/db/logs/mongod_ssl_01.log \
--auth \
--sslPEMKeyFile /etc/ssl/mongo/mongoDB.pem \
--sslMode requireSSL \
--sslCAFile /etc/ssl/mongo/rootCA.pem
```

Alternatively if using a configuration file add in the following:

```
sslPEMKeyFile = /data_new/db/keys/ssl_01.pem
sslCAFile =/etc/ssl/mongo/rootCA.pem
sslMode = requireSSL
#sslMode = allowSSL
#sslMode = preferSSL
```

Please refer to the official mongoDB documentation for a detailed description of the sslMode options.

TRUSTSTORE CONFIGURATION

Create the truststore - this is required on the agent side:

IMPORTANT: use *welcome1* as the password for this agent internal store

Firstly, to ensure the private key and certificates are imported we need to convert the agent cert/key to pkcs12:

```
openssl pkcs12 -export -in agent.crt -inkey agent.key -out agent.p12 -name agentKey -CAfile rootCA.pem -caname root
```

We can then import using keytool:

```
keytool -importkeystore -deststorepass welcome1 -destkeystore truststore.ts \
 -srckeystore agent.p12 -srcstoretype PKCS12 -srcstorepass welcome1 -alias agentKey
```

Then add in the root CA:

```
keytool -importcert -trustcacerts -file /etc/ssl/mongo/rootCA.pem -alias rootCA -keystore ./truststore.ts -storepass welcome1
```

Now verify that all is ok:

```
keytool -list -keystore ./truststore.ts
```

```
Enter keystore password:

Keystore type: JKS
Keystore provider: SUN

Your keystore contains 2 entries

rootca, 04-Sep-2015, trustedCertEntry,
Certificate fingerprint (MD5):
4F:3E:51:A8:B7:A2:74:F8:47:0B:82:4B:71:F8:FC:4D
agentkey, 04-Sep-2015, PrivateKeyEntry,
Certificate fingerprint (MD5):
36:CD:0A:D0:D4:6E:BC:F4:F8:BF:5A:81:2C:62:5C:F3
```

AGENT AND TARGET CONFIGURATION

Copy the following files to the agent host-

truststore.ts

agent.pem

rootCA.pem

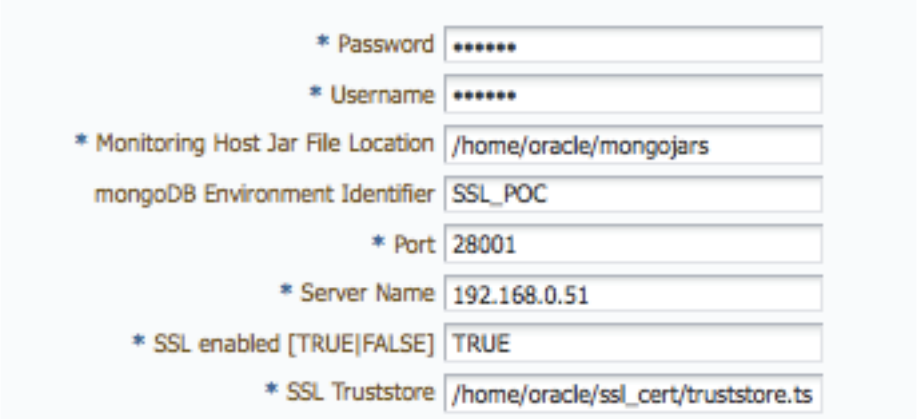
IMPORTANT: chmod 600 each of the above files to ensure only the agent operating system user can access them.

In this example we will hold these in /home/oracle/ssl_cert:

```
-rw-------  1 oracle dba    5154 Sep  6 03:30 agent.pem
-rw-------  1 oracle dba    2025 Sep  6 03:38 rootCA.pem
-rw-------  1 oracle dba    5363 Sep  6 02:33 truststore.ts
```

Targets within EM require the ‘SSL enabled’ and ‘SSL Truststore’ parameters to be set. This will allow SSL configuration to function for agent monitoring.

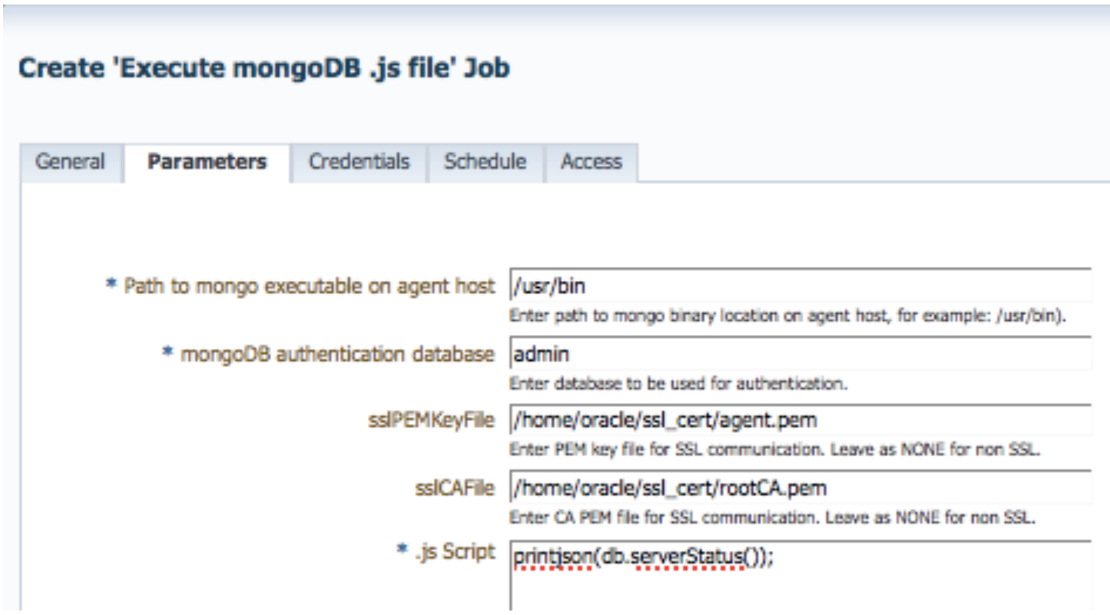
An example target configuration:



* Password	••••••
* Username	••••••
* Monitoring Host Jar File Location	/home/oracle/mongojars
mongoDB Environment Identifier	SSL_POC
* Port	28001
* Server Name	192.168.0.51
* SSL enabled [TRUE|FALSE]	TRUE
* SSL Truststore	/home/oracle/ssl_cert/truststore.ts

The mongoDB .js job execution feature requires the definition of rootCA, sslPemKeyFile and sslCAFile parameters.

An example .js job definition:



Create 'Execute mongoDB .js file' Job

* Path to mongo executable on agent host: /usr/bin
Enter path to mongo binary location on agent host, for example: /usr/bin).

* mongoDB authentication database: admin
Enter database to be used for authentication.

sslPEMKeyFile: /home/oracle/ssl_cert/agent.pem
Enter PEM key file for SSL communication. Leave as NONE for non SSL.

sslCAFile: /home/oracle/ssl_cert/rootCA.pem
Enter CA PEM file for SSL communication. Leave as NONE for non SSL.

* .js Script:

```
printjson(db.serverStatus());
```

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