NetBrain® Integrated Edition 8.0

System Upgrade Guide

Distributed Deployment

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1. Upgrading System

The upgrade process ensures data integrity, which means that the data in the current system will be still available after upgrading. If you encounter any issues during the upgrade process, contact NetBrain Support Team for help.

> **Note:** Before upgrading your system, check its current version and the network connectivity requirements.

Upgrade from IEv7.1x

1. Terminate System Tasks
2. Stop Server Services
3. Back Up MongoDB Data
4. Upgrade MongoDB
5. Upgrade Elasticsearch
6. Upgrade License Agent
7. Upgrade Redis
8. Upgrade RabbitMQ
9. Upgrade Web/Web API Server
10. Upgrade Worker Server
11. Upgrade Task Engine
12. Upgrade Front Server Controller
13. Upgrade Front Server
14. Upgrade Service Monitor Agent
15. Unbind Perpetual License
16. Activate Subscription License
17. Verify Upgrade Results
18. Customize MongoDB Disk Alert Rules
19. Tune Live Access
20. Schedule Benchmark Task

Network Connectivity Requirements

Source	Destination	Protocol and Port Number *)
Thin Client	Web Server Web API Server	HTTP/HTTPS (80/443)
Service Monitor Agent	Web API Server	HTTP/HTTPS (80/443)
Web API Server	Knowledge Cloud Domain (https://knowledgecloud.netbraintech.com/)	HTTPS (443)
Web API Server Worker Server Task Engine Front Server Controller	MongoDB	TCP 27017
Web API Server Worker Server	Elasticsearch	TCP 9200
Web API Server	License Agent	TCP 27654
Web API Server Worker Server Front Server Controller	Redis	TCP 6379 (non-SSL)/TCP 7000 (SSL)
Web API Server Worker Server Task Engine Front Server Controller	RabbitMQ	TCP 5672
Worker Server Task Engine Front Server	Front Server Controller	TCP 9095
Front Server	Live Network	ICMP/SNMP/Telnet/SSH/REST API
Front Server	Ansible Agent (add-on)	TCP 50051

> **Note:** *) The port numbers listed in this column are defaults only. The actual port numbers used during installation might be different.

1.1. Terminating System Tasks

1. Log in to the System Management page.
2. In the System Management page, select **Operations > Task Manager** from the quick access toolbar.
3. Select all running tasks and click **End Process**.

1.2. Stopping Server Services

To avoid any further dataset changes or data corruption while reinstalling MongoDB/Elasticsearch binary files or restoring MongoDB/Elasticsearch data, stop the relevant services.

1. Log in to the Windows servers where NetBrain applications are installed and stop the following services in the Task Manager.

   > **Tip:** If you have deployed a Worker Server cluster or Web API Server cluster, stop the services on each node.

NetBrain Component	Service Name
Web API Server	W3SVC
Web API Server	WAS
Worker Server	NetBrainWorkerServer
Front Server	NetBrainFrontServer
Task Engine	NetBrainTaskEngine
Front Server Controller	NetBrainFrontServerController
Redis	RedisMaster
RabbitMQ	RabbitMQ

2. Disable the **Cron** task on the MongoDB Server. The **Cron** task is used to automatically pull up the MongoDB service timely when it is down.
   1) Log in to the Linux server where the MongoDB is installed as **root** user.
   2) Open a command prompt and run the `crontab -e` command to edit the auto script.

      ```
      [root@localhost ~]# crontab -e
      ```

```
*/1 * * * * /bin/bash -c 'if /usr/sbin/service mongod status|grep -q -E "(dead)|failed";
then /usr/sbin/service mongod start; fi' >/dev/null 2>&1
```

3) Add a pound sign **#** (highlighted) at the beginning of the auto script and save the changes. For how to edit the autoscript, see Appendix: Editing a File with VI Editor for more details.

```
#*/1 * * * * /bin/bash -c 'if /usr/sbin/service mongod status|grep -q -E "(dead)|failed";
then /usr/sbin/service mongod start; fi' >/dev/null 2>&1
```

1.3. Backing Up MongoDB Data

Before upgrading the system, it is highly recommended to back up all MongoDB data in case of any data loss or corruption during the upgrade process. The backup data will be used to restore data after MongoDB is reinstalled. See Restoring MongoDB Data for more details.

In case that you don't want to stop the service of MongoDB or the volume of the MongoDB data is small, you can refer to Dumping MongoDB Data for another way to back up the data and refer to Restoring Dumped MongoDB Data to restore the dumped data.

The following steps introduces how to use the `cp` command to copy underlying MongoDB data files directly for backup.

> **Notes:**
>
> – Make sure you have stopped all relevant services before backing up data.
>
> – The backup data can only be used to restore the database on the same server.

1. Log in to the Linux server where the MongoDB node is installed as the **root** user.
2. Stop the service of MongoDB.
   1) Run the `systemctl stop mongod` command to stop the MongoDB service.

      > **Note:** If you modified the MongoDB service name in the **install_mongodb.conf** file during the MongoDB installation, you must replace the service name accordingly.

   2) Run the `ps -ef|grep mongod` command to verify whether the **mongod** process is stopped.

      ```
      [root@localhost ~]# ps -ef| grep mongod
      root     15136 14237  0 10:42 pts/2    00:00:00 grep --color=auto mongod
      ```

      > **Note:** If the **mongod** process is stopped, the result should only contain one entry as shown above.

3. Run the `mkdir /etc/mongodb_databk` command to create a directory under the **/etc** directory to save the backup data.

```
[root@localhost ~]# mkdir /etc/mongodb_databk
```

> **Note:** Ensure the backup directory (**/etc/mongodb_databk** in this example) has sufficient space to store the backup data.

4. Run the `cd /opt/mongodb` command to navigate to the **/opt/mongodb** directory.

> **Note:** If you modified the following default directory to store all MongoDB data files during the MongoDB installation, you must use the new directory (available in **mongod.conf**) accordingly.

5. Run the `du -hs data` command under the **/usr/lib/mongodb** directory to check the total size of MongoDB backup data.

6. Run the `cp -a data /etc/mongodb_databk` command under the **/usr/lib/mongodb** directory to copy all MongoDB data files from the **data** directory to the **/etc/mongodb_databk** directory.

```
[root@localhost mongodb]# cp -a data /etc/mongodb_databk
```

7. Run the `cd /etc/mongodb_databk` command to navigate to the **/etc/mongodb_databk** directory.

8. Run the `ls -al` command under the **/etc/mongodb_databk** directory to browse the backup data.

```
[root@localhost mongodb_databk]# ls -al
total 136
drwxr-xr-x.  3 root root         18 Jun 6 22:49 .
drwxr-xr-x.  6 root root         79 Jun 6 22:48 ..
drwxr-xr-x.  4 netbrain netbrain 106496 Jun 6 22:49 data
```

9. Run the `systemctl start mongod` command to start the MongoDB service.

1.4. Upgrading MongoDB

Pre-Upgrade Task

- Ensure you have upgraded the Linux OS to **Red Hat Enterprise Linux Server 7.5/7.6/7.7/7.8, 64-bit** or **CentOS 7.5/7.6/7.7/7.8, 64-bit** to avoid installation or upgrade failure. Refer to Linux System Upgrade Instructions Online for more details. If your Linux server has no access to the Internet, refer to Linux System Upgrade Instructions Offline.

> **Note:** During and after the Linux OS upgrade, do not restart the Linux server, and keep all the NetBrain services on Linux server including MongoDB running normally and all the services on the Windows server stopped.

Upgrading MongoDB

1. Log in to the Linux server as the **root** user.

   > **Note:** It is highly recommended to install **numactl** on the Linux Server to optimize MongoDB performance. Run the `rpm -qa|grep numactl` command to check whether **numactl** has already been installed. If it has not been installed yet and the Linux server has access to the Internet, run the `yum install numactl` command to install it online.

2. Run the `mkdir` command to create a directory under the **/opt** directory to place the installation package. For example, **netbraintemp8.0.3**.

   > **Note**: Don't place the installation package under any personal directories, such as **/root**.

3. Run the `cd /opt/netbraintemp8.0.3` command to navigate to the **/opt/netbraintemp8.0.3** directory.

4. Download the installation package.

   - **Option 1:** If the Linux server has no access to the Internet, obtain the **mongodb-linux-x86_64-rhel7-4.0.6-8.0.3.tar.gz** file from NetBrain and upload it to the **/opt/netbraintemp8.0.3** directory by using a file transfer tool.
   - **Option 2:** If the Linux server has access to the Internet, run the `wget http://download.netbraintech.com/mongodb-linux-x86_64-rhel7-4.0.6-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to directly download the **mongodb-linux-x86_64-rhel7-4.0.6-8.0.3.tar.gz** file from NetBrain official download site.

     > **Note:** The download link is case-sensitive.
     >
     > **Tip:** Run the `yum -y install wget` command to install the **wget** command if it has not been installed on the server.

5. Run the `tar -zxvf mongodb-linux-x86_64-rhel7-4.0.6-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to extract installation files.

   ```
   [root@centos netbraintemp8.0.3]# tar -zxvf mongodb-linux-x86_64-rhel7-4.0.6-8.0.3.tar.gz
   MongoDB/
   MongoDB/config/
   ...
   MongoDB/upgrade/upgrade_single_node/upgrade.sh
   ```

6. Run the `cd MongoDB/upgrade/upgrade_single_node` command to navigate to the **MongoDB/upgrade/upgrade_single_node** directory.

7. Run the `systemctl start mongod` command to restart the MongoDB service.

8. Run the `./upgrade.sh` command under the **upgrade_single_node** directory.

> **Note:** Ensure MongoDB service is up and running before executing the `./upgrade.sh` command.
>
> **Note:** If the default username and password were changed during the installation of MongoDB, you must enter these customized values during the upgrade.

9. After the MongoDB Server is successfully upgraded, run the `systemctl status mongod` command to check its service status.

```
 [root@localhost ~]# systemctl status mongod
  mongod.service - MongoDB service
  Loaded: loaded (/usr/lib/systemd/system/mongod.service; enabled; vendor preset: disabled)
  Active: active (running) since Thu 2020-07-16 10:15:52 EDT; 56s ago
  Process: 18325 ExecStop=/usr/bin/pkill mongod (code=exited, status=0/SUCCESS)
  Process: 18373 ExecStart=/bin/mongod -f /etc/mongodb/mongod.conf (code=exited,
status=0/SUCCESS)
  Main PID: 18382 (mongod)
  Memory: 213.6M (limit: 6.8G)
...
```

> **Tip:** It is highly recommended to run the `rm -rf /opt/netbraintemp8.0.3/MongoDB/config/setup.conf` command to delete the **setup.conf** file from the server after MongoDB is successfully upgraded because the file may cause security vulnerability.

1.5. Upgrading Elasticsearch

Pre-Upgrade Task

- Ensure you have upgraded the Linux OS to **Red Hat Enterprise Linux Server 7.5/7.6/7.7/7.8, 64-bit** or **CentOS 7.5/7.6/7.7/7.8, 64-bit** to avoid installation or upgrade failure. Refer to Linux System Upgrade Instructions Online for more details. If your Linux server has no access to the Internet, refer to Linux System Upgrade Instructions Offline.

> **Note:** During and after the Linux OS upgrade, do not restart the Linux server, and keep all the NetBrain services on Linux server including MongoDB running normally and all the services on the Windows server stopped.

Upgrading Elasticsearch

1. Log in to the Linux server as the **root** user.
2. Run the `mkdir` command to create a directory under the **/opt** directory to place the installation package. For example, **netbraintemp8.0.3**.

3. Run the `cd /opt/netbraintemp8.0.3` command to navigate to the **/opt/netbraintemp8.0.3** directory.

4. Download the installation package.

   - **Option 1:** If the Linux server has no access to the Internet, obtain the **elasticsearch-linux-x86_64-rhel7-6.7.2-8.0.3.tar.gz** file from NetBrain and then upload it to the **/opt/netbraintemp8.0.3** directory by using a file transfer tool.
   - **Option 2:** If the Linux server has access to the Internet, run the `wget http://download.netbraintech.com/elasticsearch-linux-x86_64-rhel7-6.7.2-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to directly download the **elasticsearch-linux-x86_64-rhel7-6.7.2-8.0.3.tar.gz** file from NetBrain official download site.

     > **Note:** The download link is case-sensitive.
     >
     > **Tip:** Run the `yum -y install wget` command to install the **wget** command if it has not been installed on the server.

5. Run the `tar -zxvf elasticsearch-linux-x86_64-rhel7-6.7.2-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to extract installation files.

```
[root@centos netbraintemp8.0.3]# tar -zxvf elasticsearch-linux-x86_64-rhel7-6.7.2-8.0.3.tar.gz
Elasticsearch/
Elasticsearch/config/
...
Elasticsearch/upgrade.sh
```

6. Run the `cd Elasticsearch` command to navigate to the **Elasticsearch** directory.

7. Run the `./upgrade.sh` command under the **Elasticsearch** directory.

   > **Note:** If the default username and password were changed during the installation of Elasticsearch, you must enter these customized values during the upgrade.

8. After the Elasticsearch is successfully upgraded, run the `systemctl status elasticsearch` command to check its service status.

```
[root@localhost ~]# systemctl status elasticsearch
  elasticsearch.service - Elasticsearch
  Loaded: loaded (/usr/lib/systemd/system/elasticsearch.service; enabled; vendor preset:
disabled)
    Active: active (running) since Thu 2020-07-16 10:23:46 EDT; 230ms ago
  Docs: http://www.elastic.co
  Main PID: 22168 (elasticsearch)
  Memory: 4.6G
...
```

9. Run the `curl -s -XGET --user <username:password> http://<IP address>:<port>` command to check the current version of Elasticsearch.

> **Note:** If you enabled SSL, replace `http` with `https`.

Example:

```
[root@localhost Elasticsearch]# curl -s -XGET --user admin:admin http://10.10.3.142:9200
{
  "name" : "node1",
  "cluster_name" : "elastic-search-cluster",
  "cluster_uuid" : "OctFIL44T--5mArFA93r-A",
  "version" : {
    "number" : "6.7.2",
    "build_flavor" : "oss",
    "build_type" : "rpm",
    "build_hash" : "8f0685b",
    "build_date" : "2020-07-16T18:41:22.859Z",
    "build_snapshot" : false,
    "lucene_version" : "7.7.0",
    "minimum_wire_compatibility_version" : "5.6.0",
    "minimum_index_compatibility_version" : "5.0.0"
  },
  "tagline" : "You Know, for Search"
}
```

> **Tip:** It is highly recommended to run the `rm -rf /opt/netbraintemp8.0.3/Elasticsearch/config/setup.conf` command to delete the **setup.conf** file from the server after Elasticsearch is successfully upgraded because the file may cause security vulnerability.

1.6. Upgrading License Agent

Pre-Upgrade Task

- Ensure you have upgraded the Linux OS to **Red Hat Enterprise Linux Server 7.5/7.6/7.7/7.8, 64-bit** or **CentOS 7.5/7.6/7.7/7.8, 64-bit** to avoid installation or upgrade failure. Refer to Linux System Upgrade Instructions Online for more details. If your Linux server has no access to the Internet, refer to Linux System Upgrade Instructions Offline.

> **Note:** During and after the Linux OS upgrade, do not restart the Linux server, and keep all the NetBrain services on Linux server including MongoDB running normally and all the services on the Windows server stopped.

Upgrading License Agent

1. Log in to the Linux server as the **root** user.

2. Run the `mkdir` command to create a directory under the **/opt** directory to place the installation package. For example, **netbraintemp8.0.3**.

3. Run the `cd /opt/netbraintemp8.0.3` command to navigate to the **/opt/netbraintemp8.0.3** directory.

4. Download the installation package.
   - **Option 1:** If the Linux server has no access to the Internet, obtain the **netbrain-licenseagent-linux-x86_64-rhel7-8.0.3.tar.gz** file from NetBrain and then upload it to the **/opt/netbraintemp8.0.3** directory by using a file transfer tool.
   - **Option 2:** If the Linux server has access to the Internet, run the `wget http://download.netbraintech.com/netbrain-licenseagent-linux-x86_64-rhel7-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to directly download the file from NetBrain official download site.

   > **Note:** The download link is case-sensitive.
   >
   > **Tip:** Run the `yum -y install wget` command to install the **wget** command if it has not been installed on the server.

5. Run the `tar -zxvf netbrain-licenseagent-linux-x86_64-rhel7-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to extract installation files.

```
[root@localhost netbraintemp8.0.3]# tar -zxvf netbrain-licenseagent-linux-x86_64-rhel7-
8.0.3.tar.gz
License/
License/config/
License/config/install_licenseagent.conf
License/config/setup.conf
...
License/upgrade.sh
```

6. Run the `cd License` command to navigate to the **License** directory.

7. Run the `./upgrade.sh` command under the **License** directory.
   1) Read the license agreement, and then type **YES** and press the **Enter** key.
   2) Type **I ACCEPT** and press the **Enter** key to accept the license agreement. The script starts to check whether the system configuration of the Linux server meets the requirement, and all required dependent packages are installed for License Agent.

```
[root@localhost License]# ./upgrade.sh

Please read the End User License Agreement ("EULA") for the license type (perpetual or
subscription)
purchased in the order form at https://www.netbraintech.com/legal-tc/ carefully. I have read
the
subscription EULA, if I have purchased a subscription license, or the perpetual EULA, if I
have
purchased a perpetual license, at the link provided above. Please type "YES" if you have read
```

```
the
applicable EULA and understand its and understand its contents, or "NO" if you have not read
the
applicable EULA. [YES/NO]: YES

Do you accept the terms in the subscription EULA, if you have purchased a subscription
license, or
the perpetual EULA, if you have purchased a perpetual license? If you accept, and to continue
with
the installation, please type "I Accept" to continue. If you do not accept, and to quit the
installation script, please type "CANCEL" to stop. [I ACCEPT/CANCEL]: I ACCEPT
...
INFO: Component Name: License Agent
INFO: RPM name: netbrainlicense
INFO: RPM package list:
INFO: Starting to check system
...
INFO: Successfully installed License Agent. Service is running.
INFO: Backing up uninstall.sh SUCCEEDED.
INFO: Upgrading License Agent SUCCEEDED.
```

8. After the License Agent is successfully upgraded, run the `systemctl status netbrainlicense` command to check its service status.

```
[root@localhost ~]# systemctl status netbrainlicense
  netbrainlicense.service - NetBrain license agent service
  Loaded: loaded (/usr/lib/systemd/system/netbrainlicense.service; enabled; vendor preset:
disabled)
  Active: active (running) since Thu 2020-07-16 10:32:04 EDT; 218ms ago
  Main PID: 27328 (licensed)
  CGroup: /system.slice/netbrainlicense.service
          └─ 27328 /usr/bin/netbrainlicense/licensed -f /etc/netbrainlicense/licensed.conf
```

1.7. Upgrading Redis

Complete the following steps to upgrade Redis:

1. Installing Redis on Linux
2. Uninstalling Redis on Windows

1.7.1.Installing Redis on Linux

Pre-installation Task

- Ensure you have upgraded the Linux OS to **Red Hat Enterprise Linux Server 7.5/7.6/7.7/7.8, 64-bit** or **CentOS 7.5/7.6/7.7/7.8, 64-bit** to avoid installation or upgrade failure. Refer to Linux System Upgrade Instructions Online for more details. If your Linux server has no access to the Internet, refer to Linux System Upgrade Instructions Offline.

> **Note:** During and after the Linux OS upgrade, do not restart the Linux server, and keep all the NetBrain services on Linux server including MongoDB running normally and all the services on the Windows server stopped.

Installing Redis on Linux

1. Log in to the Linux server as the **root** user.
2. Run the `mkdir` command to create a directory under the **/opt** directory to place the installation package. For example, **netbraintemp8.0.3**.
3. Run the `cd /opt/netbraintemp8.0.3` command to navigate to the **/opt/netbraintemp8.0.3** directory.
4. Download the installation package.
   - **Option 1:** If the Linux server has no access to the Internet, obtain the **redis-linux-x86_64-rhel7-6.0.4-8.0.3.tar.gz** file from NetBrain and then upload it to the **/opt/netbraintemp8.0.3** directory by using a file transfer tool.
   - **Option 2:** If the Linux server has access to the Internet, run the `wget http://download.netbraintech.com/redis-linux-x86_64-rhel7-6.0.4-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to directly download the **redis-linux-x86_64-rhel7-6.0.4-8.0.3.tar.gz** file from NetBrain official download site.

   > **Note:** The download link is case-sensitive.
   >
   > **Tip:** Run the `yum -y install wget` command to install the **wget** command if it has not been installed on the server.
5. Run the `tar -zxvf redis-linux-x86_64-rhel7-6.0.4-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to extract installation files.

```
[root@localhost netbraintemp8.0.3]# tar -zxvf redis-linux-x86_64-rhel7-6.0.4-8.0.3.tar.gz
redis/
redis/config/
...
redis/config/setup.conf
...
```

```
redis/install.sh
...
```

6. Run the `cd redis/config` command to navigate to the **config** directory.

7. Modify the parameters in the **setup.conf** file located under the **config** directory and save the changes. For how to modify the configuration file, refer to Editing a File with VI Editor.

```
[root@localhost config]# vi setup.conf
#Redis configuration file

#Note= Other than the username and password, other entries
#can only contain letters and numbers, and should start with a letter.

#Account info.Password should not contain: {}[]:",'|<>@&^%\ or a space. Password should be same
in all nodes if the mode is cluster.
Password=admin

# Mode use 'standalone' if single installation, use 'cluster' if HA mode
Mode=standalone

# Port is used to start the redis service on specified port. We use default port 6379.
Port=6379

# Data Path is used to store redis files. Default path /var/lib/redis.
DataPath=/var/lib/redis

# Log Path is used to store redis log files. Default path /var/log/redis.
LogPath=/var/log/redis

# Role (NodeRole can only be 'master' or 'slave')
NodeRole=master
# This option will be used to install sentinel on master node. It can only be 'yes' or 'no'
MasterInstallSentinel=no
# Master Node (Master Node can support ip address, hostname or FQDN and is used if the Mode is
cluster and
used in slave node)
MasterNode=
# Sentinel Port is used to start the redis sentinel service on specified port. We use default
port 6380.
SentinelPort=6380

# Resource limitation. It can only be 'yes' or 'no'
ResourceLimit=no
# CPU Limit. should be specified as %. Range is 1% to 100%
CPULimit=100%
#Memory Limit. should be specified as %. Range is 1% to 100%
MemmoryLimit=100%

# TLS. It can only be 'yes' or 'no'
UseSSL=no
Certificate=/etc/ssl/cert.pem
PrivateKey=/etc/ssl/key.pem
# Stunnel Port is used to start the stunnel service on specified port. We use default port
7000.
```

```
StunnelPort=7000
# Stunnel Sentinel Port is used to start the redis sentinel service on specified port.
We use default port 7001 for SSL. this is needed only for slave node.
StunnelSentinelPort=7001
```

8. Run the `cd ..` command to navigate to the **redis** directory.

9. Run the `./install.sh` script under the **redis** directory to install Redis.

```
[root@localhost redis]# ./install.sh
INFO: checking root
INFO: Creating log file
INFO: checking date
INFO: Preprocessing SUCCEEDED
INFO: Starting to check system
...
  Collecting system information SUCCEEDED.
...
INFO: System checking SUCCEEDED
INFO: Dependent packages checking SUCCEEDED
...
INFO: Configuration parameters checking SUCCEEDED
INFO: Installing /opt/netbraintemp8.0.3/redis/sources/redis-6.0.4-1.e17.x86_64.rpm
Preparing...                          ########################################
Updating / installing...
redis-6.0.4-1.el7                     ########################################
INFO: Official rpm package installing SUCCEEDED
INFO: Configuration parameters updating SUCCEEDED
INFO: Permission assigning SUCCEEDED
...
   Loaded: loaded (/usr/lib/systemd/system/redis.service; enabled; vendor preset: disabled)
   Active: active (running) since Tue 2020-07-14 00:38:49 EST; 37min ago
   Main PID: 56299 (redis-server)
   Memory: 1.2M
   CGroup: /system.slice/redis.service
           56299 /sbin/redis-server *:6379

Jul 13 15:47:04 netbrain_data_server systemd[1]: Started Redis.
INFO: Checking redis Status
INFO: Verification SUCCEEDED
INFO: Successfully installed Redis
INFO: Backup uninstall.sh SUCCEEDED
INFO: Backup fix_releaseinfo.json SUCCEEDED
```

10. Run the `systemctl status redis` command to verify whether its service starts successfully.

```
[root@localhost ~]# systemctl status redis
 redis.service - Redis
   Loaded: loaded (/usr/lib/systemd/system/redis.service; enabled; vendor preset: disabled)
   Active: active (running) since Mon 2020-07-13 15:47:04 EDT; 10min ago
 Main PID: 52318 (redis-server)
 Memory: 7.7M
...
```

> **Note:** When your disk space is insufficient for large amounts of logs, you can modify the log settings in the **redis.conf** file under the **/etc/logrotate** directory.
>
> **Tip:** It is highly recommended to run the `rm -rf /opt/netbraintemp8.0.3/redis/config/setup.conf` command to delete the **setup.conf** file from the server after Redis is successfully installed because the file may cause security vulnerability.

Parameters

The following table describes the parameters that can be configured when installing Redis.

Parameter	Default Value	Description
Password	`admin`	Specify the admin password used to connect to Redis. **Note:** The password cannot contain any of the following special characters, and its length cannot exceed 64 characters. `{ } [ ] : " , ' | < > @ & ^ % \` and `spaces`
Mode	`standalone`	Set whether to enable cluster deployment. Keep the default value for a standalone deployment.
Port	`6379`	Specify the port number that the master Redis node listens to.
DataPath	`/var/lib/redis/`	Specify the storage path for all data files of Redis.
LogPath	`/var/log/redis/`	Specify the storage path for all log files of Redis.
NodeRole	`master`	Set the role for the current node. Available options are **master**, **slave**, and **sentinel**. Keep the default value for a standalone deployment.
MasterInstallSentinel	`no`	Keep the default value.
MasterNode		This parameter is only required for cluster deployments.
SentinelPort	`6380`	The port number that the slave or sentinel Redis node listens to.
ResourceLimit	`no`	Set whether to limit the system resource usage for Redis.
CPULimit	`100%`	The maximum CPU utilization of the machine that can be consumed by Redis.
MemoryLimit	`100%`	The maximum memory capacity of the machine that can be consumed by Redis.
UseSSL	`no`	Set whether to enable the encrypted connections to Redis by using SSL. **Note:** Redis itself does not support SSL. It uses stunnel as an SSL service agent. Stunnel will be automatically installed together with Redis.

Parameter	Default Value	Description
Certificate	`/etc/ssl/cert.pem`	Specify the storage path for all the certificates and key files used for SSL authentication. **Note:** It is required only if **UseSSL** is enabled.
PrivateKey	`/etc/ssl/key.pem`	Specify the name of SSL private key file. **Note:** It is required only if **UseSSL** is enabled.
StunnelPort	`7000`	Specify the port number for stunnel to establish an SSL encrypted tunnel on the master and slave Redis node. **Note:** It is required only if **UseSSL** is enabled.
StunnelSentinelPort	`7001`	Specify the port number for stunnel to establish an SSL encrypted tunnel on the sentinel Redis node. **Note:** It is required only if **UseSSL** is enabled.

1.7.1.1. Uninstalling Redis on Windows

Complete the following steps with administrative privileges. Take Windows Server 2012 R2 for example.

1. Click the Windows start menu, and then click the icon to open the **Apps** pane.
2. Right-click the **Uninstall Redis (Cache) Server** app in the pane, and then select **Run as administrator** from the list to launch the Installation Wizard.
3. Click **Yes** when a confirmation dialog box pops up.
4. Select the **Delete all existing user data** check box to delete all registry information and files under its installation path, and click **Next**.
5. Click **Finish** to exit the Installation Wizard.

1.8. Upgrading RabbitMQ

Complete the following steps to upgrade RabbitMQ:

1. Installing RabbitMQ on Linux
2. Uninstalling RabbitMQ on Windows

1.8.1.Installing RabbitMQ on Linux

Pre-Installation Task

- Ensure you have upgraded the Linux OS to **Red Hat Enterprise Linux Server 7.5/7.6/7.7/7.8, 64-bit** or **CentOS 7.5/7.6/7.7/7.8, 64-bit** to avoid installation or upgrade failure. Refer to Linux System Upgrade Instructions Online for more details. If your Linux server has no access to the Internet, refer to Linux System Upgrade Instructions Offline.

> **Note:** During and after the Linux OS upgrade, do not restart the Linux server, and keep all the NetBrain services on Linux server including MongoDB running normally and all the services on the Windows server stopped.

- Ensure the hostname of the Linux server must be resolvable by DNS or configured in **/etc/hosts** because RabbitMQ needs a resolvable hostname no matter whether it is a standalone server or a cluster.
- RabbitMQ has dependencies on the third-party package **socat** and **logrotate**. Before you install the RabbitMQ, run the `rpm -qa|grep socat` and `rpm -qa|grep logrotate` commands to check whether they have been installed on the server. If they have not been installed yet, you can choose either option below to install the dependencies.
  - **Online Install:** run the `yum -y install socat` and `yum -y install logrotate` commands to install them online.
  - **Offline Install:** refer to Offline Installing Third-party Dependencies for more details.

Installing RabbitMQ on Linux

1. Log in to the Linux server as the **root** user.
2. Run the `mkdir` command to create a directory under the **/opt** directory to place the installation package. For example, **netbraintemp8.0.3**.
3. Run the `cd /opt/netbraintemp8.0.3` command to navigate to the **/opt/netbraintemp8.0.3** directory.
4. Download the installation package.
   - **Option 1:** If the Linux server has no access to the Internet, obtain the **rabbitmq-linux-x86_64-rhel7-3.8.1-8.0.3.tar.gz** file from NetBrain and then upload it to the **/opt/netbraintemp8.0.3** directory by using a file transfer tool.
   - **Option 2:** If the Linux server has access to the Internet, run the `wget http://download.netbraintech.com/rabbitmq-linux-x86_64-rhel7-3.8.1-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to directly download the **rabbitmq-linux-x86_64-rhel7-3.8.1-8.0.3.tar.gz** file from NetBrain official download site.

     > **Note:** The download link is case-sensitive.

> **Tip:** Run the `yum -y install wget` command to install the **wget** command if it has not been installed on the server.

5. Run the `tar -zxvf rabbitmq-linux-x86_64-rhel7-3.8.1-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to extract installation files.

```
[root@localhost netbraintemp8.0.3]# tar -zxvf rabbitmq-linux-x86_64-rhel7-3.8.1-8.0.3.tar.gz
rabbitmq/
rabbitmq/config/
rabbitmq/config/setup.conf
...
rabbitmq/install.sh
..
```

6. Run the `cd rabbitmq/config` command to navigate to the **config** directory.

7. Modify the parameters in the **setup.conf** file and save the changes. For how to modify the configuration file, refer to Editing a File with VI Editor.

```
[root@centos config]# vi setup.conf
#RabbitMQ configuration file

#Account info
#The UserName or Password should not contain: {}[]:",'|<>@&^%\ or a space
#The length of UserName or Password should not be more than 64 characters
UserName=admin
Password=admin

# Mode (Mode can only be 'mirror' or 'standalone')
Mode=standalone

# A unique cluster string used to join all cluster nodes. Each cluster node
# must have the same cluster ID.
ClusterId=rabbitmqcluster

# The role of the current node in the cluster. Two roles can be configured:
# master or slave. If the role of the current node is slave, you must specify
# the hostname of the master node in MasterNode.
NodeRole=master
MasterNode=localhost

# Resource limitation
ResourceLimit=no

# CPULimit and MemoryLimit should be ended by % and the range is from 1% to 100%
CPULimit=100%
MemLimit=100%

# TLS
UseSSL=no
CertFile=/etc/ssl/cert.pem
KeyFile=/etc/ssl/key.pem

# Port
```

```
TcpPort=5672

# Log path
LogPath=/var/log/rabbitmq
```

8. Run the `cd ..` command to navigate to the **rabbitmq** directory.

9. Run the `./install.sh` script under the **rabbitmq** directory to install RabbitMQ.

```
[root@localhost rabbitmq]# ./install.sh
INFO: Creating installation log file
INFO: Preprocessing SUCCEEDED
INFO: Start checking system
...
warning: /opt/netbraintemp8.0.3/rabbitmq/sources/erlang-21.2.4-1.el7.centos.x86_64.rpm: Header
V4 RSA/SHA1
Signature, key ID 6026dfca: NOKEY
Preparing...                          ########################################
Updating / installing...
erlang-22.1.7-1.el7            ########################################
INFO: Installing /opt/netbraintemp8.0.3/rabbitmq/sources/rabbitmq-server-3.8.1-1.el7.noarch.rpm
warning: /opt/netbraintemp8.0.3/rabbitmq/sources/rabbitmq-server-3.8.1-1.el7.noarch.rpm: Header
V4 RSA/SHA256
Signature, key ID 6026dfca: NOKEY
Preparing...                          ########################################
Updating / installing...
rabbitmq-server-3.8.1-1.el7           ########################################
INFO: Official rpm package installing SUCCEEDED
INFO: Configuration parameters updating SUCCEEDED
INFO: Permission setting SUCCEED
Created symlink from /etc/systemd/system/multi-user.target.wants/rabbitmq-server.service to
/usr/lib/systemd/system/rabbitmq-server.service.
rabbitmq-server.service - RabbitMQ broker
   Loaded: loaded (/usr/lib/systemd/system/rabbitmq-server.service; enabled; vendor preset:
disabled)
   Active: active (running) since Mon 2020-07-13 16:04:46 EDT; 8ms ago
 Main PID: 53927 (beam.smp)
   Status: "Initialized"
   Memory: 70.8M (limit: 15.5G)
...
   Active: active (running) since MON 2020-07-13 16:05:23 EDT; 7ms ago
INFO: Verification SUCCEEDED
INFO: Backing up uninstall.sh SUCCEEDED
INFO: Successfully installed RabbitMQ
```

10. Run the `systemctl status rabbitmq-server` command to verify whether its service starts successfully.

```
[root@localhost ~]# systemctl status rabbitmq-server
 rabbitmq-server.service - RabbitMQ broker
   Loaded: loaded (/usr/lib/systemd/system/rabbitmq-server.service; enabled; vendor preset:
disabled)
   Active: active (running) since Mon 2020-07-13 16:05:23 EDT; 13min ago
   Process: 19522 ExecStop=/usr/sbin/rabbitmqctl shutdown (code=exited, status=0/SUCCESS)
 Main PID: 4509 (beam.smp)
   Status: "Initialized"
```

```
   Memory: 96.5M
...
```

> **Tip:** It is highly recommended to run the `rm -rf /opt/netbraintemp8.0.3/rabbitmq/config/setup.conf` command to delete the **setup.conf** file from the server after RabbitMQ is successfully installed because the file may cause security vulnerability.

Parameters

The following table describes the parameters that can be configured when installing RabbitMQ.

Parameter	Default Value	Description
Username	`admin`	Specify the admin username used to connect to RabbitMQ. **Note:** The username and password cannot contain any of the following special characters, and its length cannot exceed 64 characters. `{ } [ ] : " , ' | < > @ & ^ % \` and `spaces`
Password	`admin`	Specify the admin password used to connect to RabbitMQ.
Mode	`standalone`	Set whether to enable cluster deployment. Modify it to **standalone** for a standalone deployment.
ClusterId	`rabbitmqcluster`	Specify the cluster id used by all nodes to join the cluster. This parameter is required only for cluster deployments.
NodeRole	`master`	Set the role for the current node. Available options are **master** and **slave**. Keep the default value for a standalone deployment.
MasterNode	`localhost`	This parameter is only required for cluster deployments. Keep the default value as it is for a standalone deployment.
ResourceLimit	`no`	Set whether to limit the system resource usage for RabbitMQ.
CPULimit	`100%`	Specify the maximum CPU utilization of the machine that can be consumed by RabbitMQ.
MemoryLimit	`100%`	Specify the maximum memory capacity of the machine that can be consumed by RabbitMQ.
UseSSL	`no`	Set whether to enable the encrypted connections to RabbitMQ by using SSL. **Tip:** If **UseSSL** is set to **yes**, you can follow the steps below to modify the RabbitMQ Plugin config file after the service monitor is installed. 1) Run the `vi /etc/netbrain/nbagent/check/rabbitmq.yaml` command to open the RabbitMQ Plugin config file.

Parameter	Default Value	Description

		2) Set the **ssl** value to **true** and save the changes. For how to modify the configuration file, see Editing a File with VI Editor for more details.
		`[root@localhost check]# vi rabbitmq.yaml`
		`init_config:`
		
		`instances:`
		`- name: default`
		`managementPort: 15672,`
		`checkAvailableIntervalSeconds: 300`
		`ssl: true`
		`collectQueues:`
		`equal: []`
		`startWith:`
		`['FullTextSearch','TaskManager','event_callback','RMClientCallback','ETL_Task']`
		`endWith: ['IndexDriver']`

Certificate	`/etc/ssl/cert.pem`	Specify the storage path for all the certificates and key files used for SSL authentication. **Note:** It is required only if **UseSSL** is enabled.
PrivateKey	`/etc/ssl/key.pem`	Specify the name of SSL private key file. **Note:** It is required only if **UseSSL** is enabled.
TcpPort	`5672`	Specify the port number that RabbitMQ service listens to.
LogPath	`/var/log/rabbitmq`	Specify the directory to save logs of RabbitMQ.

1.8.1.1. Uninstalling RabbitMQ on Windows

Complete the following steps with administrative privileges.

Take Windows Server 2012 R2 for example:

1. Click the Windows start menu and then click the icon to open the **Apps** pane.
2. Right-click the **Uninstall RabbitMQ (Message) Server** app in the pane, and then select **Run as administrator** from the drop-down list to launch the Installation Wizard.
3. Click **Yes** when a confirmation dialog box pops up.
4. Select the **Delete all existing user data** check box to delete all registry information and files under its installation path and click **Next**.
5. Click **Finish** to exit the Installation Wizard.

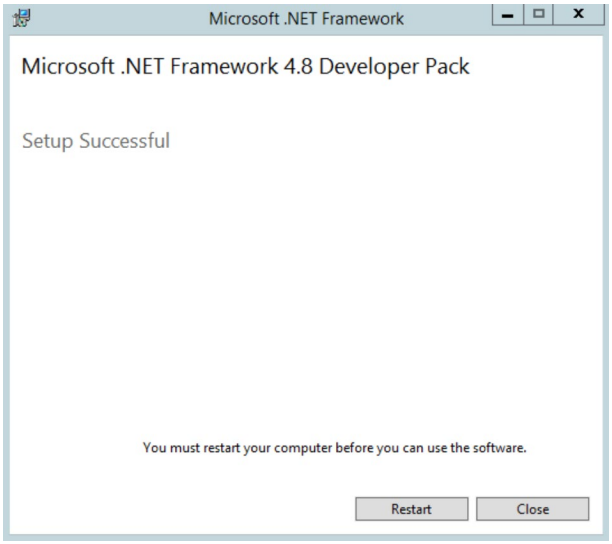
1.9. Upgrading Web/Web API Server

> **Note:** Before the upgrading, clean the **C:\Windows\Temp** folder to make sure the upgrade process goes smoothly.

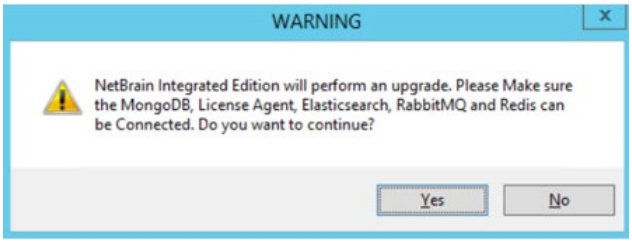
Complete the following steps to upgrade Web API Server and Web Server on the same machine with administrative privileges.

1. Download the **netbrain-ie-windows-x86_64-8.0.3.zip** file from http://download.netbraintech.com/netbrain-ie-windows-x86_64-8.0.3.zip and save it in your local folder.
2. Extract installation files from the **netbrain-ie-windows-x86_64-8.0.3.zip** file.
3. Right-click the **netbrain-ie-windows-x86_64-8.0.3.exe** file, and then select **Run as administrator** to start the Installation Wizard.
4. Follow the Installation Wizard to complete the upgrade step by step:
   1) If **.NET Framework 4.8** has not been pre-installed on this machine, the Installation Wizard will guide you through the installation of **.NET Framework 4.8** first.

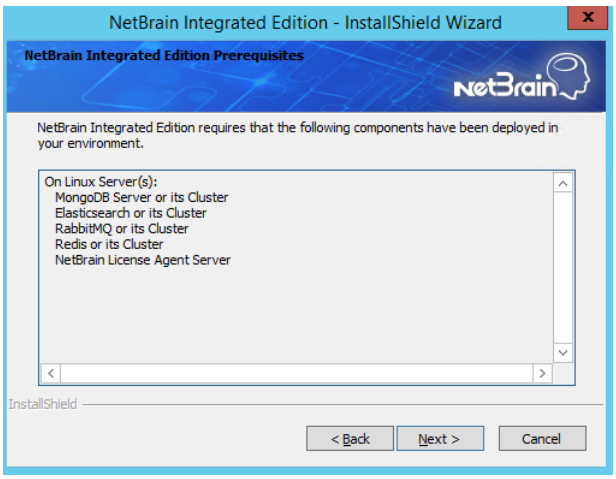
      > **Note:** Make sure the Windows update is of the latest. For Windows Server 2012, the update **KB2919442** and **KB2919355** must be installed before the .NET Framework 4.8 installation can start.
      >
      > **Note:** Some running applications must be closed during the installation of .NET Framework 4.8, such as Server Manager.
      >
      > **Note:** After .NET Framework 4.8 is successfully installed, you must click **Restart** to restart the machine immediately. Otherwise, the upgrade will fail due to the failure of upgrading the new .Net Framework. After the machine reboots, ensure the FIPS is disabled after restarting the machine. To disable the FIPS setting, modify the **Enabled** value to **0** under the **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Lsa\FipsAlgorithmPolicy** directory of Windows registry.



2) Stop the services of Web/Web API server manually before continuing the upgrade.
3) Click **Yes** in the dialog box to initiate the upgrade.

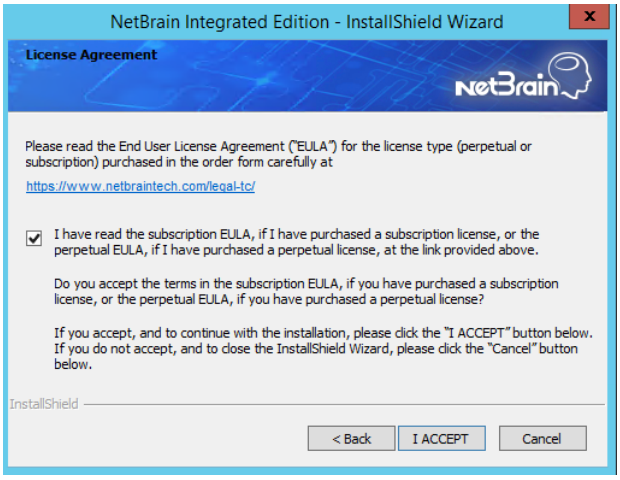


4) On the Welcome page, click **Next**.
5) On the NetBrain Integrated Edition Prerequisites page, read the components that must be set up in your environment beforehand and click **Next**.

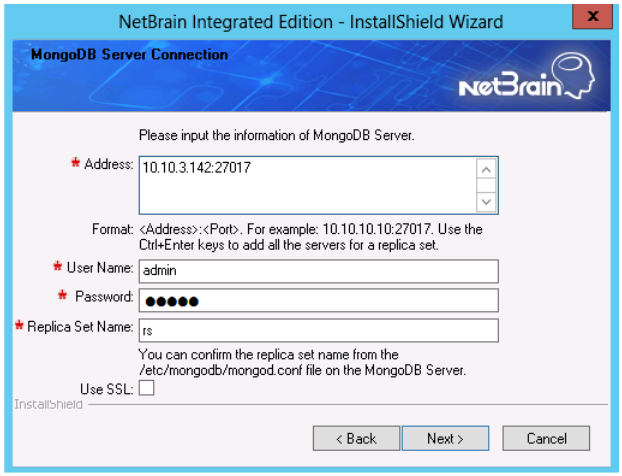


6) On the System Configuration page, review the system configuration summary and click **Next**.

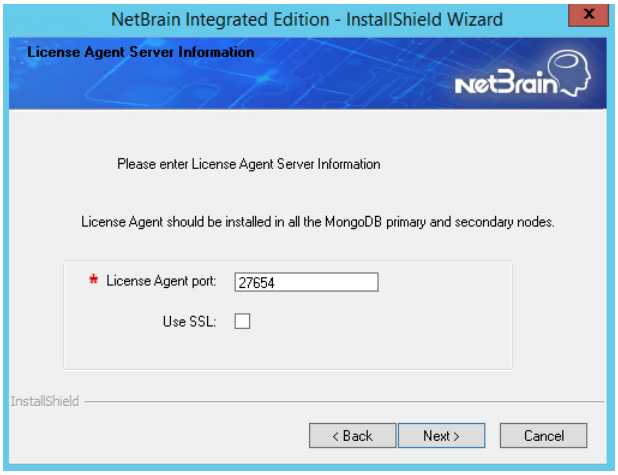
7) On the License Agreement page, read the license agreements, select the **I have read the subscription EULA** check box and then click **I ACCEPT**.



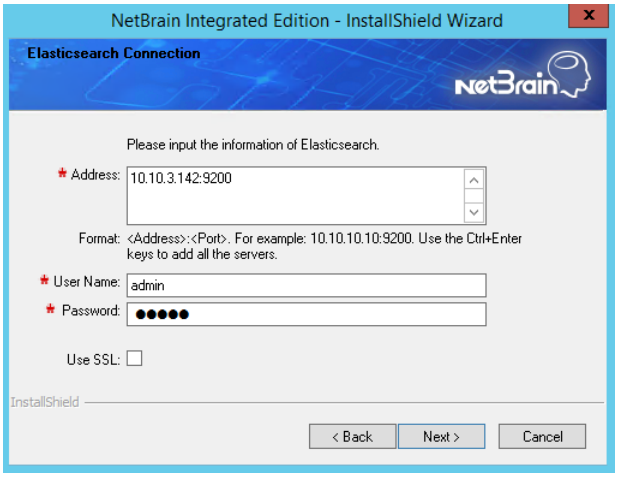
8) On the MongoDB Server Connection page, enter the password that you created when installing MongoDB and then click **Next**.



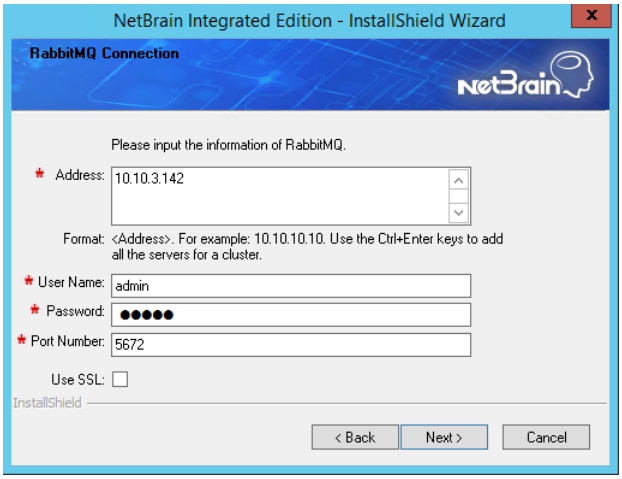
9) On the License Agent Server Information page, verify the information to connect to the License Agent, and then click **Next**.



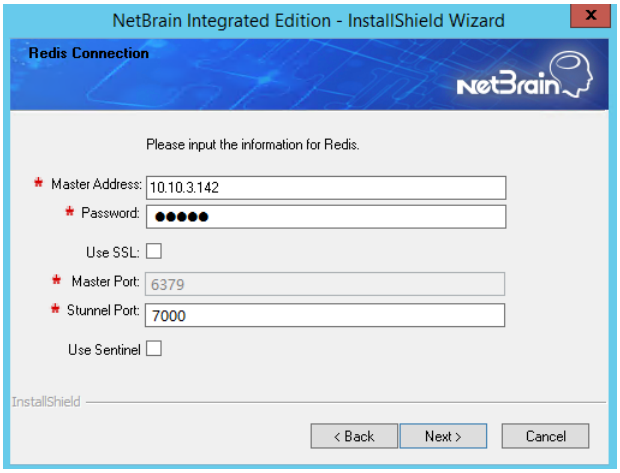
10) On the Elasticsearch Connection page, enter the IP address and password of the Elasticsearch, and then click **Next**.



11) On the RabbitMQ Connection page, enter the IP address and admin password of the RabbitMQ, and then click **Next**.

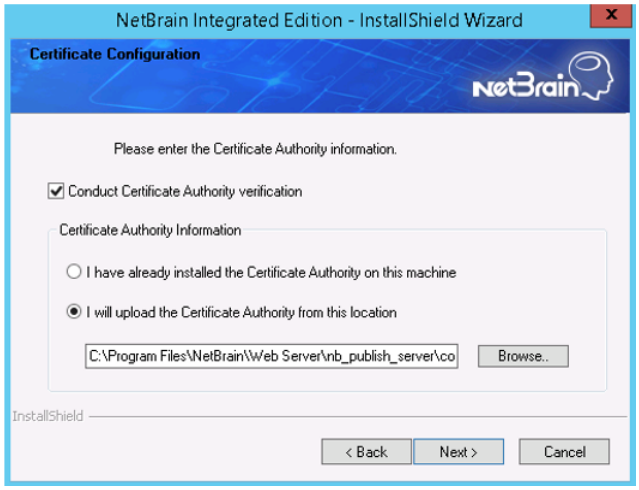


12) On the Redis Connection page, enter the IP address and admin password of the Redis, and then click **Next**.



13) (Required only if the **Use SSL** check box is selected when configuring the connections to MongoDB, License Agent, Elasticsearch, RabbitMQ, or Redis.) On the Certificate Configuration page, confirm the Certificate Authority

(CA) of the SSL certificates used on these servers, and then click **Next**.



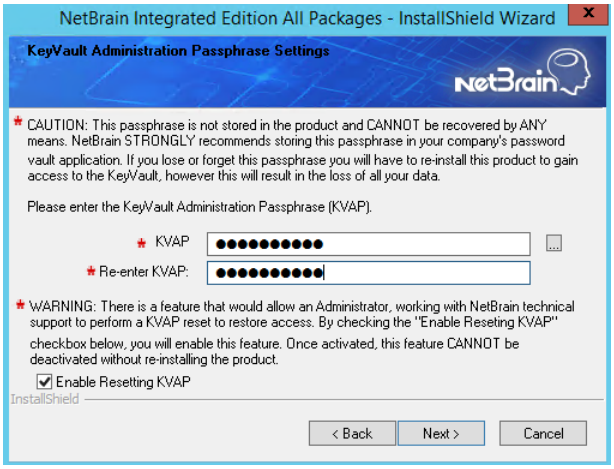
To authenticate CA:

a) Select the **Conduct Certificate Authority verification** check box.

b) If the CA has not been installed on this machine, click **Browse** to import the CA certificate file, for example, **ca.pem**; otherwise, select **I have already installed the Certificate Authority on this machine**.

> **Note:** Only the certificate in **Base-64 encoded X.509 PEM** format is supported.
>
> **Note:** The following conditions must be met if you select **I have already installed the Certificate Authority on this machine:**
> - The CA certificate must contain CRL Distribution Points property with valid CRL HTTP distribution point URL. (CRL stands for Certificate Revocation List.)
> - The CRL Distribution Points URL must be accessible to Web Server/Worker Server.
> - Internet access must be ensured if the certificate is signed by third-party CA.

14) On the KeyVault Administration Passphrase Settings page, create a passphrase to initialize and manage the system KeyVault which contains all encryption keys to protect data security. Type it twice and click **Next**.



> **Tip:** The passphrase must contain at least one uppercase letter, one lowercase letter, one number, and one special character, and the minimum permissible length is 8 characters. All special characters except for the quotation mark (") are allowed.
>
> **Note:** Keep notes of the passphrase because it is required when you scale up or upgrade these servers. In case of losing the passphrase, keep the **Enable Resetting KVAP** check box selected so that NetBrain system admin can reset the passphrase at any time.

15) Review the summary of the installation settings and click **Install**. The installation will take some time and it depends on the scale of your database.

5. After successfully upgrading the Web Server and Web API Server, click **Finish**.
6. Open the IIS Manager to check that the **Default Web Site** and **ServicesAPI** service exist.
7. Open the Task Manager to check that the **NetBrainKCProxy** service is running.

> **Tip:** To have the required configurations auto-populated during the installation of other system components, you can copy the **netbrain.ini** folder from the **C:\NBIEInstall** folder of this machine directly to the **C:\NBIEInstall** folder of the machines where Worker Server, Task Engine, and Front Server Controller will be installed.

Post-Upgrade Task

Uninstall NetBrain Update Server from the Windows Control Panel.

1.10. Upgrading Worker Server

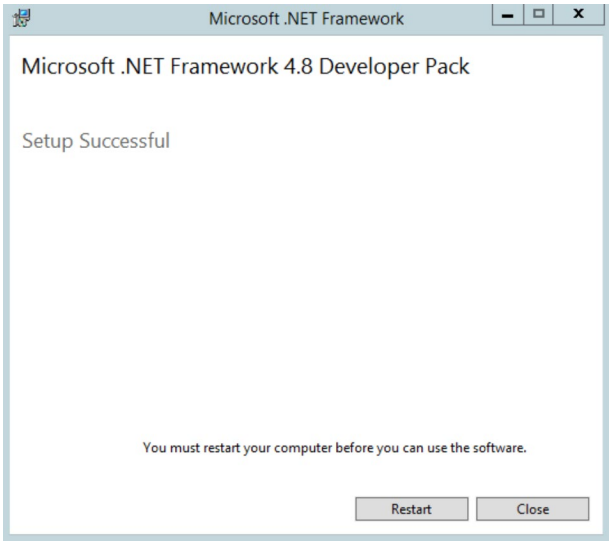
> **Note:** Before the upgrading, clean the **C:\Windows\Temp** folder to make sure the upgrade process goes smoothly.

Complete the following steps with administrative privileges.

1. Download the **netbrain-ie-windows-x86_64-8.0.3.zip** file from http://download.netbraintech.com/netbrain-ie-windows-x86_64-8.0.3.zip and save it in your local folder.
2. Extract installation files from the **netbrain-ie-windows-x86_64-8.0.3.zip** file.
3. Right-click the **netbrain-ie-windows-x86_64-8.0.3.exe** file, and then select **Run as administrator** to launch the Installation Wizard.
4. Follow the Installation Wizard to complete the upgrade step by step:

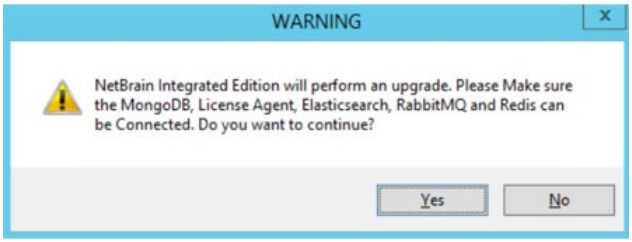
1) If **.NET Framework 4.8** has not been pre-installed on this machine, the Installation Wizard will guide you through the installation of **.NET Framework 4.8** first.

> **Note:** Make sure the Windows update is of the latest. For Windows Server 2012, the update **KB2919442** and **KB2919355** must be installed before the .NET Framework 4.8 installation can start.
>
> **Note:** Some running applications must be closed during the installation of .NET Framework 4.8, such as Server Manager.
>
> **Note:** After .NET Framework 4.8 is successfully installed, you must click **Restart** to restart the machine immediately. Otherwise, the upgrade will fail due to the failure of upgrading the new .Net Framework. After the machine reboots, ensure the FIPS is disabled after restarting the machine. To disable the FIPS setting, modify the **Enabled** value to **0** under the **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Lsa\FipsAlgorithmPolicy** directory of Windows registry.



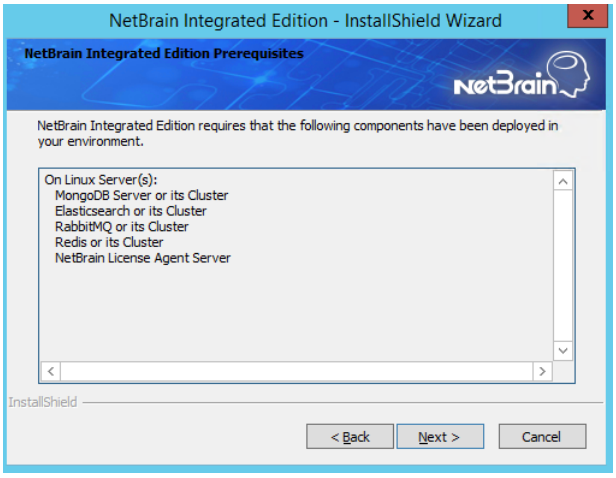
2) Stop the service of worker server manually before continuing the upgrade.

3) Click **Yes** in the dialog box to initiate the upgrade.



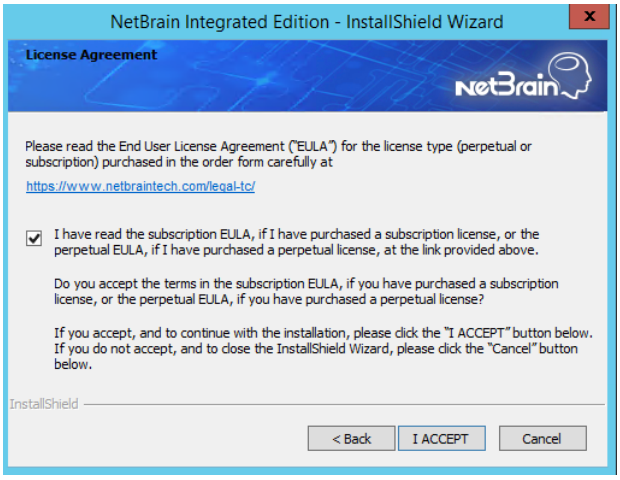
4) On the Welcome page, click **Next**.

5) On the NetBrain Integrated Edition Prerequisites page, read the components that must be set up in your environment beforehand and click **Next**.

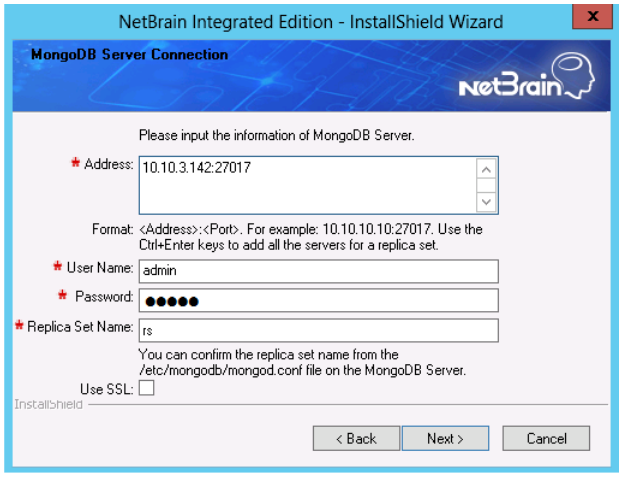


6) On the System Configuration page, review the system configuration summary and click **Next**.

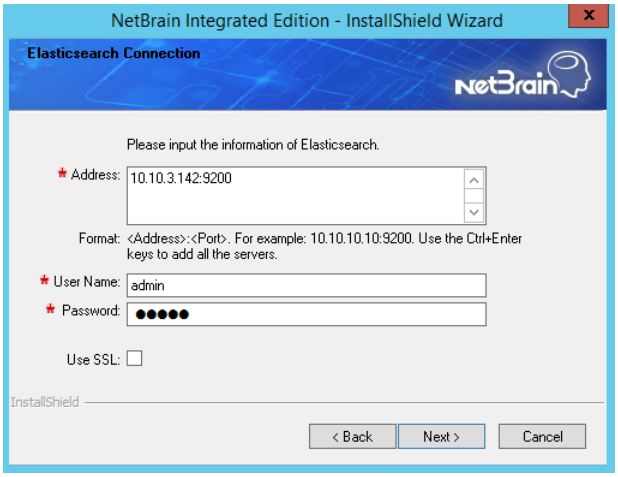
7) On the License Agreement page, read the license agreements, select the **I have read the subscription EULA** check box and then click **I ACCEPT**.



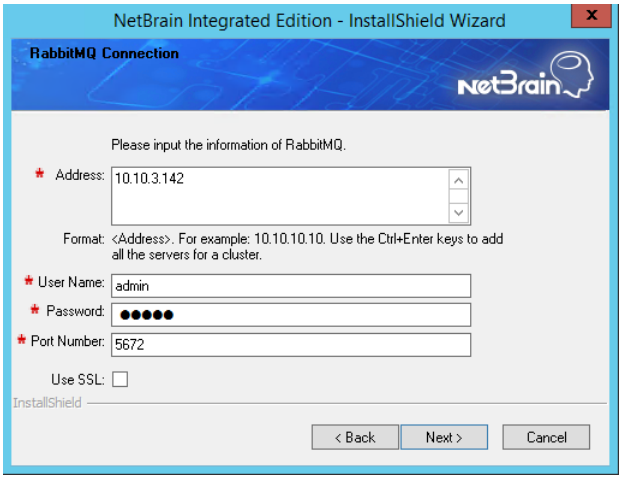
8) On the MongoDB Server Connection page, enter the password that you created when installing MongoDB and then click **Next**.



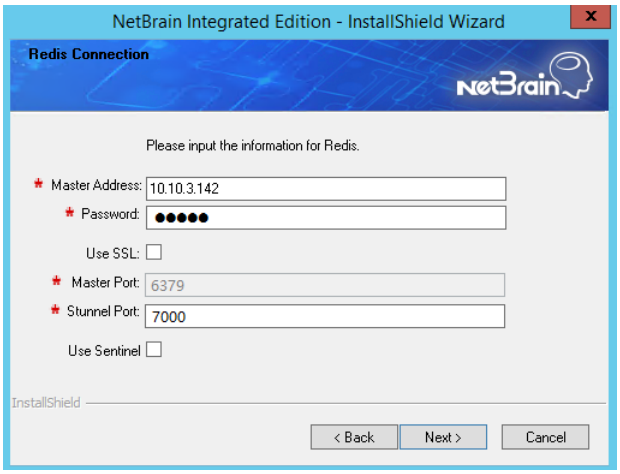
9) On the Elasticsearch Connection page, enter the IP address and password of the Elasticsearch, and then click **Next**.



10) On the RabbitMQ Connection page, enter the IP address and admin password of RabbitMQ, and then click **Next**.

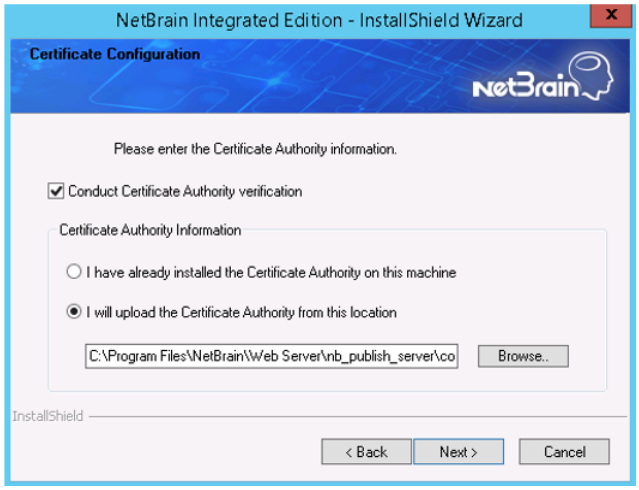


11) On the Redis Connection page, enter the IP address and admin password of the Redis, and then click **Next**.



12) (Required only if the **Use SSL** check box is selected when configuring the connections to MongoDB, License Agent, Elasticsearch, RabbitMQ, or Redis.) On the Certificate Configuration page, confirm the Certificate Authority

(CA) of the SSL certificates used on these servers, and then click **Next**.



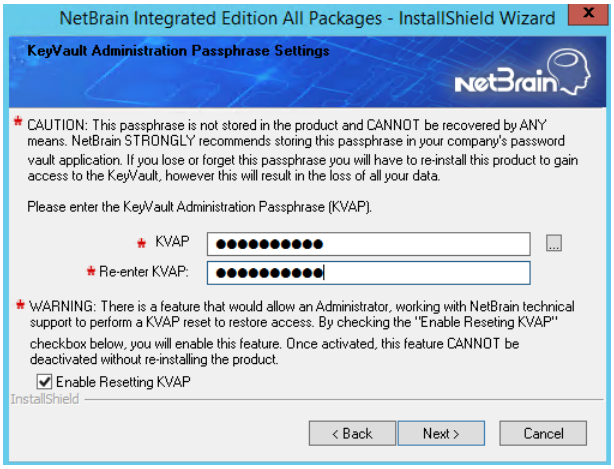
To authenticate CA:

a) Select the **Conduct Certificate Authority verification** check box.

b) If the CA has not been installed on this machine, click **Browse** to import the CA certificate file, for example, **ca.pem**; otherwise, select **I have already installed the Certificate Authority on this machine**.

> **Note:** Only the certificate in **Base-64 encoded X.509 PEM** format is supported.
>
> **Note:** The following conditions must be met if you select **I have already installed the Certificate Authority on this machine:**
> - The CA certificate must contain CRL Distribution Points property with valid CRL HTTP distribution point URL. (CRL stands for Certificate Revocation List.)
> - The CRL Distribution Points URL must be accessible to Web Server/Worker Server.
> - Internet access must be ensured if the certificate is signed by third-party CA.

14) On the KeyVault Administration Passphrase Settings page, create a passphrase to initialize and manage the system KeyVault which contains all encryption keys to protect data security. Type it twice and click **Next**.



> **Tip:** The passphrase must contain at least one uppercase letter, one lowercase letter, one number, and one special character, and the minimum permissible length is 8 characters. All special characters except for the quotation mark (") are allowed.
>
> **Note:** Keep notes of the passphrase because it is required when you scale up or upgrade the Application Server. In case of losing the passphrase, keep the **Enable Resetting KVAP** check box selected so that NetBrain system admin can reset the passphrase at any time.

15) Review the summary of the installation information and click **Install**.

5. After successfully upgrading the Worker Server, click **Finish**.
6. Open the Task Manager and navigate to the **Services** panel to check that the **NetBrainWorkerServer** service is running.
7. If you have deployed a Worker Server Cluster for load balancing, you can repeat the above steps to upgrade the Worker Servers on separate machines.

> **Note:** Make sure all cluster members have the same configurations for MongoDB, License Agent, Elasticsearch, RabbitMQ, and Redis. And your network configurations allow communications among them.

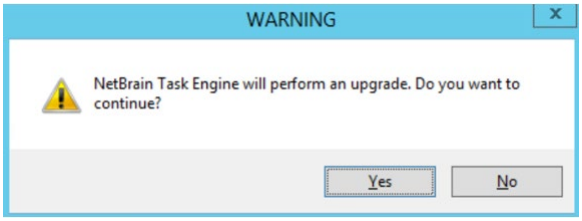
1.11. Upgrading Task Engine

> **Note:** Before the upgrading, clean the **C:\Windows\Temp** folder to make sure the upgrade process goes smoothly.

Complete the following steps with administrative privileges.

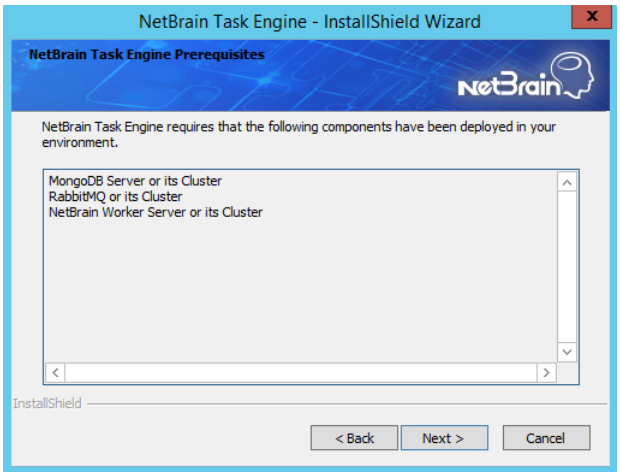
1. Download the **netbrain-taskengine-windows-x86_64-8.0.3.zip** file from http://download.netbraintech.com/netbrain-taskengine-windows-x86_64-8.0.3.zip and save it in your local folder.
2. Extract installation files from the **netbrain-taskengine-windows-x86_64-8.0.3.zip** file.
3. Right-click the **netbrain-taskengine-windows-x86_64-8.0.3.exe** file, and then select **Run as administrator** to start the Installation Wizard.

1) Click **Yes** in the dialog box to initiate the upgrade.



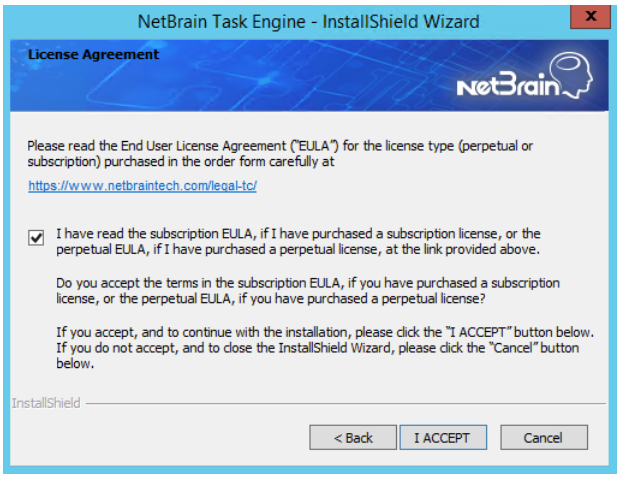
2) On the Welcome page, click **Next**.

3) On the NetBrain Task Engine Prerequisites page, view the components that must be deployed beforehand in your environment and click **Next**.

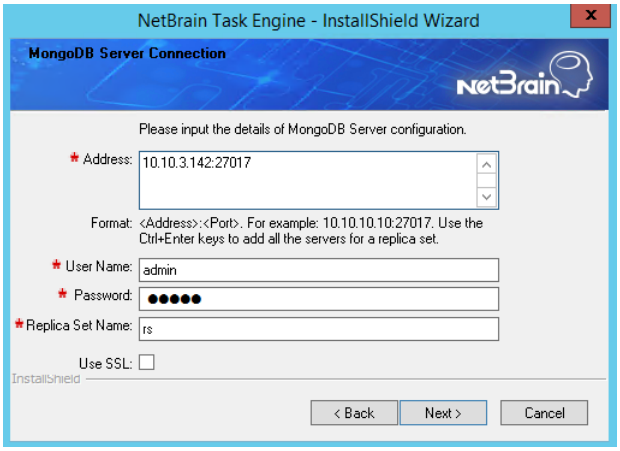


4) On the System Configuration page, review the system configuration summary and click **Next**.

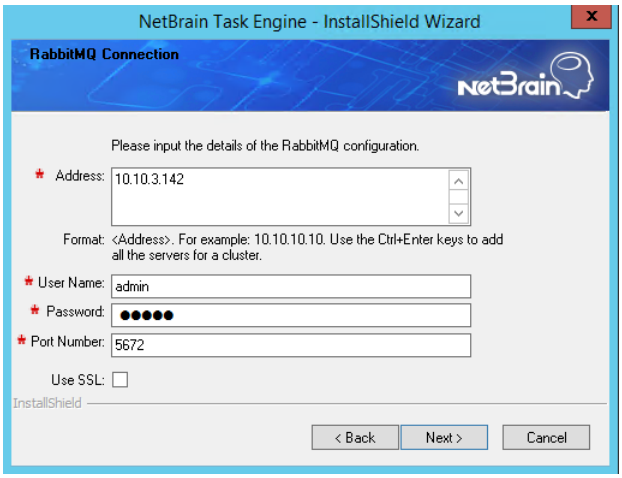
5) On the License Agreement page, read the license agreements, select the **I have read the subscription EULA** check box and then click **I ACCEPT**.



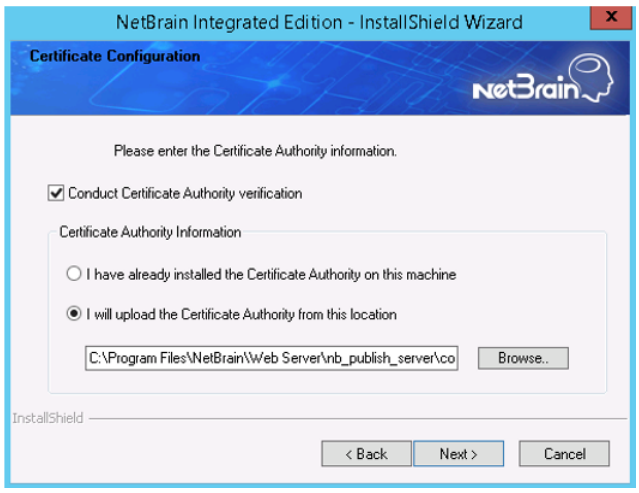
6) On the MongoDB Server Connection page, enter the admin password you created when installing MongoDB, and then click **Next**.



7) On the RabbitMQ Connection page, enter the IP address and admin password of the RabbitMQ, and then click **Next**.



11) (Required only if the **Use SSL** check box is selected when configuring the connections to MongoDB or RabbitMQ.) On the Certificate Configuration page, confirm the CA of SSL certificates, and then click **Next**.



To authenticate CA:

a) Select the **Conduct Certificate Authority verification** check box.

b) If the CA has not been installed on this machine, click **Browse** to import the CA certificate file, for example, **ca.pem**; otherwise, select **I have already installed the Certificate Authority on this machine**.

> **Note:** Only the certificate in **Base-64 encoded X.509 PEM** format is supported.
>
> **Note:** The following conditions must be met if you select **I have already installed the Certificate Authority on this machine:**
> - The CA certificate must contain CRL Distribution Points property with valid CRL HTTP distribution point URL. (CRL stands for Certificate Revocation List.)
> - The CRL Distribution Points URL must be accessible to Web Server/Worker Server.
> - Internet access must be ensured if the certificate is signed by third-party CA.

12) Review the summary of the installation information and then click **Install**.

4. After successfully upgrading the Task Engine, click **Finish**.

5. Open the Task Manager and navigate to the **Services** panel to check that the **NetBrainTaskEngine** service is running.

Post-Upgrade Task

Uninstall the **Java(TM) SE Development Kit 9.0.1 (64-bit)** from the Windows Control Panel.

> **Note**: Ensure **JDK 9.0.1** is not used by other applications before proceeding with the above step.

1.12. Upgrading Front Server Controller

> **Note:** Before the upgrading, clean the **C:\Windows\Temp** folder to make sure the upgrade process goes smoothly.

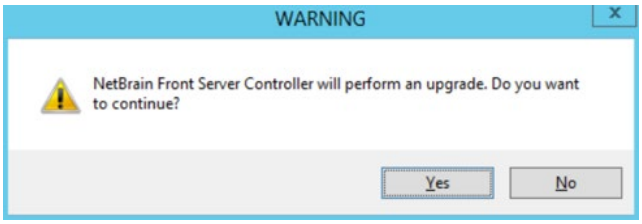
Complete the following steps with administrative privileges.

1. Download the **netbrain-frontservercontroller-windows-x86_64-8.0.3.zip** file from http://download.netbraintech.com/netbrain-frontservercontroller-windows-x86_64-8.0.3.zip and save it in your local folder.

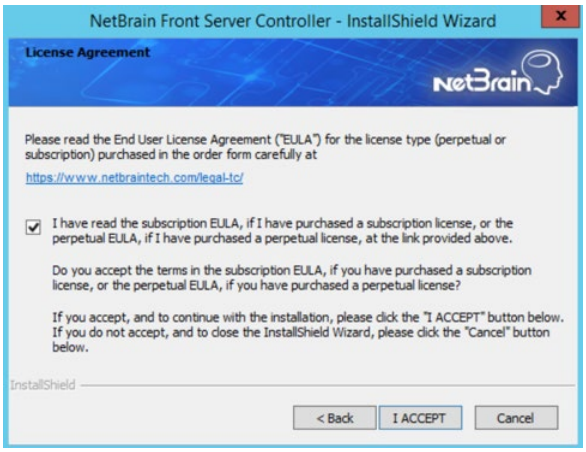
2. Extract installation files from the **netbrain-frontservercontroller-windows-x86_64-8.0.3.zip** file.

3. Right-click the **netbrain-frontservercontroller-windows-x86_64-8.0.3.exe** file, and then select **Run as administrator** to start the Installation Wizard.

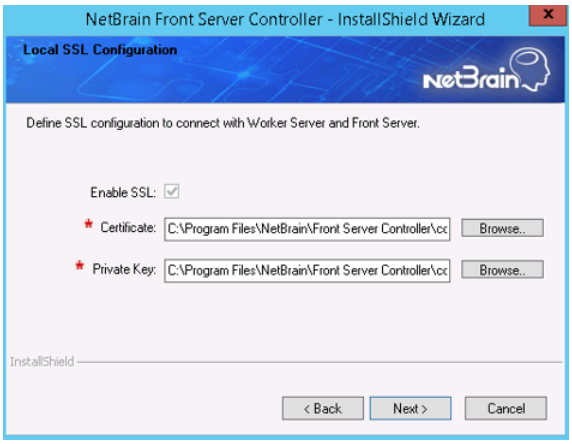
1) Click **Yes** in the dialog box to initiate the upgrade.



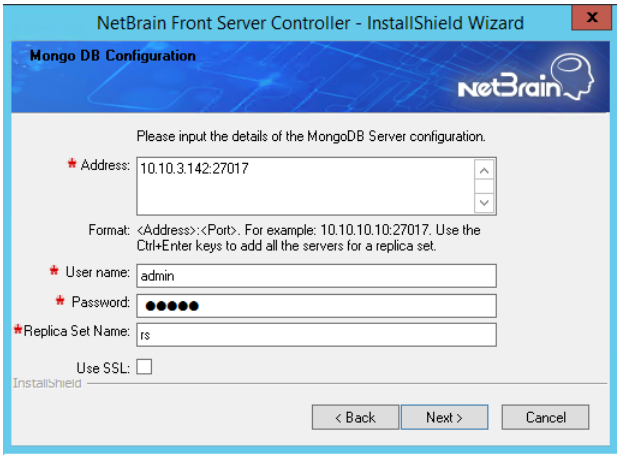
2) On the Welcome page, click **Next**.
3) On the System Configuration page, review the system configuration summary and click **Next**.
4) On the License Agreement page, read the license agreements, select the **I have read the subscription EULA** check box and then click **I ACCEPT**.



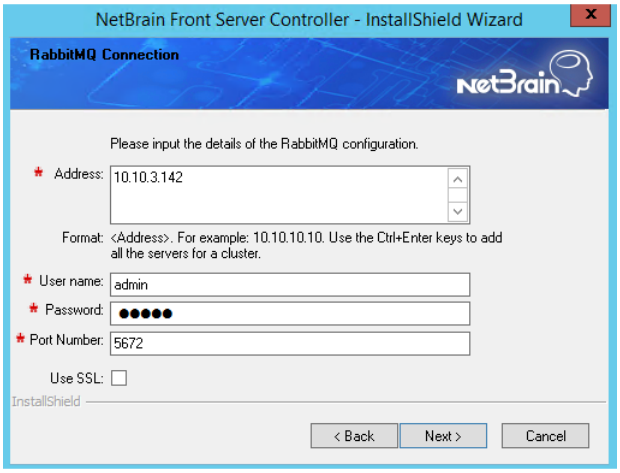
5) (Required only if SSL has already been enabled) On the Local SSL Configuration page, confirm the certificate and private key for the Front Server Controller to establish encrypted connections with Worker Server and Front Server, and then click **Next**.



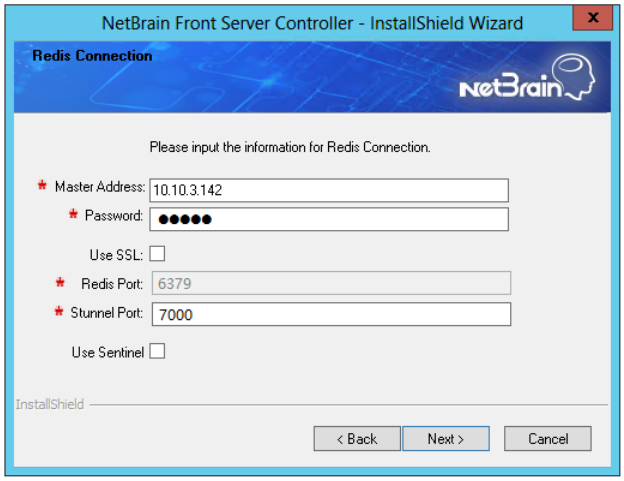
6) On the MongoDB Connection page, enter the admin password you created when installing MongoDB and then click **Next**.



7) On the RabbitMQ Connection page, enter the IP address and admin password of the RabbitMQ, and then click **Next**.



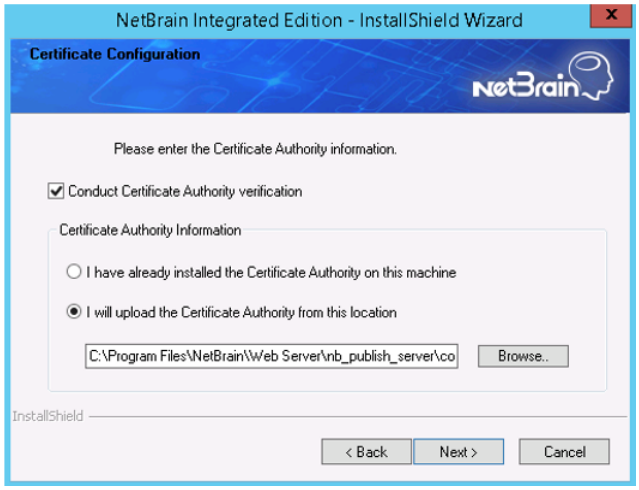
8) On the Redis Connection page, enter the IP address and admin password of the Redis, and then click **Next**.



9)

10) (Required only if the **Use SSL** check box is selected when configuring the connections to MongoDB, RabbitMQ, or Redis). On the Certificate Configuration page, confirm the CA of SSL certificates on these servers, and then

click **Next**.



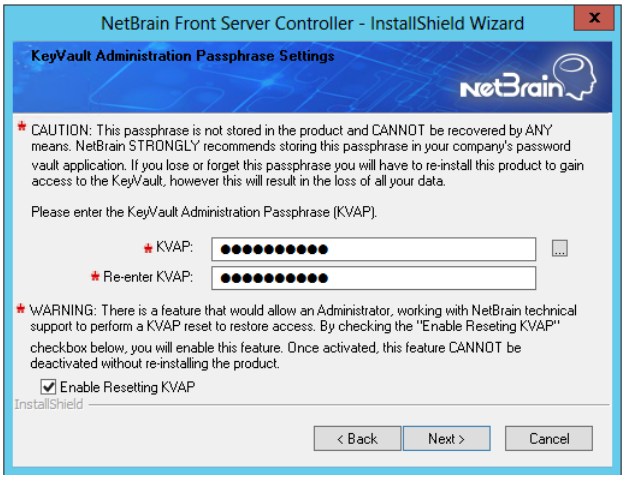
To authenticate CA:

a) Select the **Conduct Certificate Authority verification** check box.

b) If the CA has not been installed on this machine, click **Browse** to import the CA certificate file, for example, **ca.pem**; otherwise, select **I have already installed the Certificate Authority on this machine**.

> **Note:** Only the certificate in **Base-64 encoded X.509 PEM** format is supported.
>
> **Note:** The following conditions must be met if you select **I have already installed the Certificate Authority on this machine:**
> - The CA certificate must contain CRL Distribution Points property with valid CRL HTTP distribution point URL. (CRL stands for Certificate Revocation List.)
> - The CRL Distribution Points URL must be accessible to Web Server/Worker Server.
> - Internet access must be ensured if the certificate is signed by third-party CA.

11) On the KeyVault Administration Passphrase Settings page, enter the passphrase that you created when installing the Web API Server twice and click **Next**.



12) Review the summary of the installation information and click **Install**.

4. After successfully upgrading the Front Server Controller, click **Finish**.

5. Open the Task Manager and navigate to the **Services** panel to check that the **NetBrainFrontServerController** service is running.

1.13. Upgrading Front Server

Select either of the following ways to upgrade your Front Servers, depending on their operating systems:

- Upgrading Front Server on Windows
- Upgrading Front Server on Linux

1.13.1. Upgrading Front Server on Linux

Pre-Upgrade Tasks

- Ensure you have upgraded the Linux OS to **Red Hat Enterprise Linux Server 7.5/7.6/7.7/7.8, 64-bit** or **CentOS 7.5/7.6/7.7/7.8, 64-bit** to avoid installation or upgrade failure. Refer to Linux System Upgrade Instructions Online for more details. If your Linux server has no access to the Internet, refer to Linux System Upgrade Instructions Offline.

> **Note:** During and after the Linux OS upgrade, do not restart the Linux server, and keep all the NetBrain services on Linux server including MongoDB running normally and all the services on the Windows server stopped.

- Front Server has dependencies on several third-party packages. Before you install the Front Server, run the `rpm -qa|grep -E "glibc|libstdc++|libuuid|pam"` command to check whether these dependencies have been installed. If not, you can choose either option below to install the dependencies:
  - **Online Install:** run the `yum install -y glibc.x86_64 glibc.i686 libstdc++.x86_64 libstdc++.i686 libuuid.x86_64 libuuid.i686 pam.x86_64 pam.i686` command to install these third-party packages online.
  - **Offline Install:** see Appendix for more details.

Upgrading Front Server on Linux

1. Log in to the Linux server as the **root** user.

2. Run the `mkdir` command to create a directory under the **/opt** directory to place the Front Server installation package. For example, **netbraintemp8.0.3**.

3. Run the `cd /opt/netbraintemp8.0.3` command to navigate to the **/opt/netbraintemp8.0.3** directory.

4. Download the installation package.

- **Option 1:** If the Linux server has no access to the Internet, obtain the **netbrain-frontserver-linux-x86_64-rhel7-8.0.3.tar.gz** file from NetBrain and then upload it to the **/opt/netbraintemp8.0.3** directory by using a file transfer tool.
- **Option 2:** If the Linux server has access to the Internet, run the `wget http://download.netbraintech.com/netbrain-frontserver-linux-x86_64-rhel7-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to directly download the **netbrain-frontserver-linux-x86_64-rhel7-8.0.3.tar.gz** file from NetBrain official download site.

> **Note:** The download link is case-sensitive.
>
> **Tip:** Run the `yum -y install wget` command to install the **wget** command if it has not been installed on the server.

5. Run the `tar -zxvf netbrain-frontserver-linux-x86_64-rhel7-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to extract installation files.

```
[root@localhost netbraintemp8.0.3]# tar -zxvf netbrain-frontserver-linux-x86_64-rhel7-
8.0.3.tar.gz
FrontServer/
FrontServer/config/

FrontServer/upgrade.sh
...
```

6. Run the `cd FrontServer` command to navigate to the **FrontServer** directory.
7. Run the `./upgrade.sh` script under the **FrontServer** directory to upgrade the Front Server.
   1) Read the License Agreement, and type **YES**.
   2) Type **I ACCEPT** to accept the License Agreement. The script starts to install the Front Server.

```
[root@localhost FrontServer]# ./upgrade.sh
Please read the End User License Agreement ("EULA") for the license type (perpetual or
subscription) purchased in the order form at https://www.netbraintech.com/legal-tc/
carefully. I
have read the subscription EULA, if I have purchased a subscription license, or the
perpetual
EULA, if I have purchased a perpetual license, at the link provided above. Please type "YES"
if
you have read the applicable EULA and understand its contents, or "NO" if you have not read
the
applicable EULA. [YES/NO]: YES

Do you accept the terms in the subscription EULA, if you have purchased a subscription
license, or the
perpetual EULA, if you have purchased a perpetual license? If you accept, and to continue
with the
installation, please type "I ACCEPT" to continue. If you do not accept, and to quit the
installation
script, please type "CANCEL" to stop. [I ACCEPT/CANCEL]: I ACCEPT
```

```
INFO: Collecting system information... SUCCEEDED
INFO: Start checking date
INFO: Start checking rhel7x
INFO: Start checking systemd
INFO: Start checking required CPU
INFO: Start checking minimum memory
INFO: System checking SUCCEEDED
INFO: Dependent packages checking SUCCEEDED
INFO: Configuration parameters checking SUCCEEDED
...
INFO: Installing frontserver.tar SUCCEEDED
INFO: Configuration parameters updating SUCCEEDED
...
INFO: Backup uninstall.sh SUCCEEDED
INFO: Upgrading netbrainfrontserver SUCCEEDED.
```

> **Note:** The Front Server service will not be automatically started until it is successfully registered. You cannot register a Front Server immediately until adding the Front Server to a Tenant.

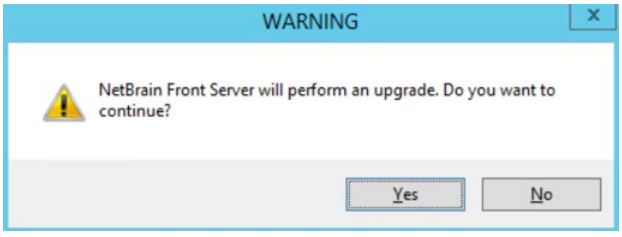
8. If you deployed multiple Front Servers for load balancing, repeat the above steps on other machines.
9. Run the `systemctl status netbrainfrontserver` command to check the service status of each node.

1.13.2. Upgrading Front Server on Windows

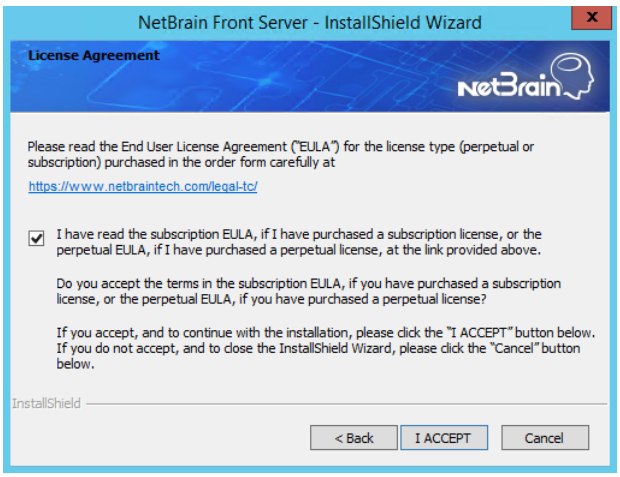
> **Note:** Before the upgrading, clean the **C:\Windows\Temp** folder to make sure the upgrade process goes smoothly.

Complete the following steps with administrative privileges.

1. Download the **netbrain-frontserver-windows-x86_64-8.0.3.zip** file from http://download.netbraintech.com/netbrain-frontserver-windows-x86_64-8.0.3.zip and save it in your local folder.
2. Extract installation files from the **netbrain-frontserver-windows-x86_64-8.0.3.zip** file.
3. Right-click the **netbrain-frontserver-windows-x86_64-8.0.3.exe** file, and then select **Run as administrator** to start the Installation Wizard.
    1) Click **Yes** in the dialog box to initiate the upgrade.



2) On the Welcome page, click **Next**.
3) On the System Configuration page, review the system configuration summary and click **Next**.
4) On the License Agreement page, read the license agreements, select the **I have read the subscription EULA** check box and then click **I ACCEPT**.



5) Review the summary of the current installation settings and click **Install**.

4. After successfully upgrading the Front Server, click **Finish**.

> **Note:** The Front Server service will not be automatically started until it is successfully registered. You cannot register a Front Server immediately until adding the Front Server to a Tenant.

5. If you have deployed multiple Front Servers for load balancing, repeat the above steps on other machines.
6. After the installation is completed, you can open the Task Manager and navigate to the **Services** panel to check whether **NetBrainFrontServer** is running.

1.14. Upgrading Service Monitor Agent

Select either of the following ways to upgrade your Service Monitor Agent, depending on the operating system:

- Upgrading Service Monitor Agent on Linux
- Upgrading Service Monitor Agent on Windows

1.14.1. Upgrading Service Monitor Agent on Linux

Pre-Upgrade Tasks

- Ensure you have upgraded the Linux OS to **Red Hat Enterprise Linux Server 7.5/7.6/7.7/7.8, 64-bit** or **CentOS 7.5/7.6/7.7/7.8, 64-bit** to avoid installation or upgrade failure. Refer to Linux System Upgrade Instructions Online for more details. If your Linux server has no access to the Internet, refer to Linux System Upgrade Instructions Offline.

> **Note:** During and after the Linux OS upgrade, do not restart the Linux server, and keep all the NetBrain services on Linux server including MongoDB running normally and all the services on the Windows server stopped.

- Service Monitor Agent has dependencies on the third-party package on **zlib-devel readline-devel bzip2-devel ncurses-devel gdbm-devel xz-devel tk-devel libffi-devel**. Run the `rpm -qa|grep -E "zlib-devel|readline-devel|bzip2-devel|ncurses-devel|gdbm-devel|xz-devel|tk-devel|libffi-devel"` command to check whether **zlib-devel readline-devel bzip2-devel ncurses-devel gdbm-devel xz-devel tk-devel libffi-devel** has been installed on this Linux server. If it has not been installed, you can choose either option below to install the dependencies:
  - **Online Install:** run the `yum -y install zlib-devel readline-devel bzip2-devel ncurses-devel gdbm-devel xz-devel tk-devel libffi-devel` command to install it online.
  - **Offline Install:** see Appendix for more details.

Upgrading Service Monitor Agent on Linux

1. Log in to the Linux server as the **root** user.
2. Run the `cd /opt/netbraintemp8.0.3` command to navigate to the **/opt/netbraintemp8.0.3** directory.
3. Download the installation package.
   - **Option 1:** If the Linux server has no access to the Internet, obtain the **netbrain-servicemonitoragent-linux-x86_64-rhel7-8.0.3.tar.gz** file from NetBrain and then upload it to the **/opt/netbraintemp8.0.3** directory by using a file transfer tool.
   - **Option 2:** If the Linux server has access to the Internet, run the `wget http://download.netbraintech.com/netbrain-servicemonitoragent-linux-x86_64-rhel7-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to directly download the **netbrain-servicemonitoragent-linux-x86_64-rhel7-8.0.3.tar.gz** file from NetBrain official download site.

   > **Note:** The download link is case-sensitive.
   >
   > **Tip:** Run the `yum -y install wget` command to install the **wget** command if it has not been installed on the server.

4. Run the `tar -zxvf netbrain-servicemonitoragent-linux-x86_64-rhel7-8.0.3.tar.gz` command under the **/opt/netbraintemp8.0.3** directory to extract installation files.

```
[root@localhost netbraintemp8.0.3]# tar -zxvf netbrain-servicemonitoragent-linux-x86_64-rhel7-
8.0.3.tar.gz
ServiceMonitorAgent/
ServiceMonitorAgent/config/
ServiceMonitorAgent/config/setup.conf
...
ServiceMonitorAgent/upgrade.sh
...
```

5. Run the `cd ServiceMonitorAgent` command to navigate to the **ServiceMonitorAgent** directory.

6. Run the `./upgrade.sh` script under the **ServiceMonitorAgent** directory to upgrade the Service Monitor Agent.
   1) Read the License Agreement, and type **YES**.
   2) Type **I ACCEPT** to accept the License Agreement. The script starts to install Service Monitor Agent.

```
[root@localhost ServiceMonitorAgent]# ./upgrade.sh

Please read the End User License Agreement ("EULA") for the license type (perpetual or
subscription) purchased in the order form at
https://www.netbraintech.com/legal-tc/ carefully. I have read the subscription EULA, if I
have purchased a subscription license, or the
perpetual EULA, if I have purchased a perpetual license, at the link provided above. Please
type "YES" if you have read the applicable EULA
and understand its contents, or "NO" if you have not read the applicable EULA. [YES/NO]: YES

Do you accept the terms in the subscription EULA, if you have purchased a subscription
license, or the perpetual EULA, if you have purchased
a perpetual license? If you accept, and to continue with the installation, please type "I
Accept" to continue. If you do not accept, and to quit
the installation script, please type "CANCEL" to stop. [I ACCEPT/CANCEL]: I ACCEPT

INFO: Collecting system information SUCCEEDED.
Starting to upgrade Service Monitor Agent...
Starting to get previous installation parameters...
Getting the previous installation parameters SUCCEEDED.
...
Configuration parameters updating SUCCEEDED.
Starting to permission assigning...
Permission assigning SUCCEEDED.
Starting to deamon setting...
Deamon setting SUCCEEDED.
INFO: Backing up uninstall.sh SUCCEEDED
...
Successfully upgraded Service Monitor Agent. Service is running.
```

7. Run the `systemctl status netbrainagent` command to verify whether its service starts successfully.

```
[root@localhost ~]# systemctl status netbrainagent
  netbrainagent.service - NetBrain Service Monitor Agent Daemon
  Loaded: loaded (/usr/lib/systemd/system/netbrainagent.service; enabled; vendor preset:
```

```
disabled)
  Active: active (running) since Tue 2020-07-14 13:36:28 EDT; 71ms ago
  Main PID: 4520 (python3)
  Memory: 73.5M
...
```

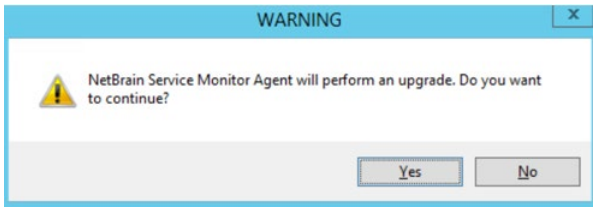
8. Repeat the above steps to upgrade the Service Monitor Agent on more Linux servers.

> **Tip:** It is highly recommended to run the `rm -rf /opt/netbraintemp8.0.3/servicemonitoragent/config/setup.conf` command to delete the **setup.conf** file from the server after Service Monitor Agent is successfully upgraded because the file may cause security vulnerability.

1.14.2. Upgrading Service Monitor Agent on Windows

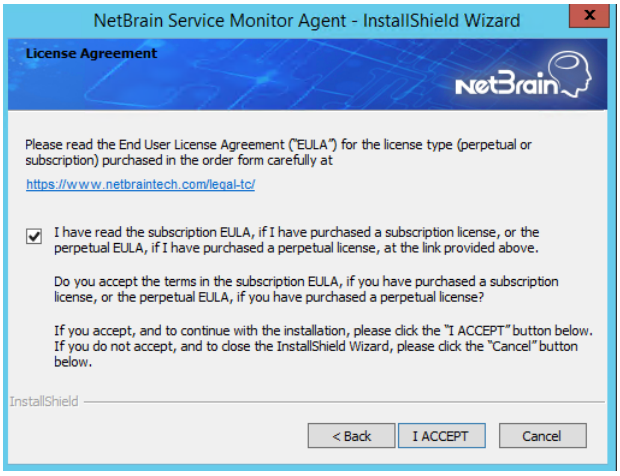
Complete the following steps with administrative privileges.

1. Download the **netbrain-servicemonitoragent-windows-x86_64-8.0.3.zip** file from http://download.netbraintech.com/netbrain-servicemonitoragent-windows-x86_64-8.0.3.zip and save it in your local folder.
2. Extract installation files from the **netbrain-servicemonitoragent-windows-x86_64-8.0.3.zip** file.
3. Right-click the **netbrain-servicemonitoragent-windows-x86_64-8.0.3.exe** file, and then select **Run as administrator** to start the Installation Wizard.
   1) Click **Yes** in the dialog box to initiate the upgrade.



   2) On the Welcome page, click **Next**.
   3) On the System Configuration page, review the system configuration summary and click **Next**.

4) On the License Agreement page, read the license agreements, select the **I have read the subscription EULA** check box and then click **I ACCEPT**.



5) Review the summary of the installation information and click **Install**.

4. After successfully upgrading the Service Monitor Agent, click **Finish**.

> **Tip:** You can open the Task Manager and navigate to the **Services** panel to check whether **NetBrainAgent** is running.

5. Repeat the above steps to upgrade the Service Monitor Agent on more Windows servers.

1.15. Unbinding Perpetual License

1. In your web browser, navigate to **http(s)://<IP address of NetBrain Web Server>/admin.html** to log in to the System Management page.

> **Note:** In order to minimize the issue caused by insufficient privilege, it's strongly recommended to use the local "admin" account to log in to the System Management page.

2. Click **OK** on a pop-up notification dialog.

3. Click **Unbind**.

4. Validate your perpetual license information and unbind it from NetBrain License Server.
   1) Select **Online** and click **Next**.
   2) Enter your license password and click **Unbind**.
   3) Click **Yes** on a notification dialog box.

> **Note:** If your NetBrain Web/Web API Server is not allowed to access the Internet, you can unbind the license from your local machine first, and then send the unbind file to NetBrain Support Team to unbind it from NetBrain License Server.
>
> 1) Select **Via Email** and click **Next**.
> 2) Enter your email address and click **Unbind**. The **netbrain.Unbind** file will be generated and downloaded to your local disk.
> 3) Send an email to NetBrain Support Team with the file attached. NetBrain support team will help remove your license information from NetBrain License Server.

1.16. Activating Subscription License

1. In the System Management page, click **Activate** under the **License** tab. The activation wizard prompts.
2. Activate your subscription license:
   1) Select **Activate Subscription License** and click **Next**.
   2) Enter the license ID and activation key that you received from NetBrain, with your first name, last name, and email address.
   3) Select the activation method based on your situation.
      - **Online** (recommended) — click **Activate** to connect to NetBrain License Server and validate your license information immediately.

        > **Note:** If your NetBrain Web/Web API Server is not allowed to access the Internet, you can configure a proxy server. Click the icon at the upper-right corner, select the **Use a proxy server to access the internet** check box and enter the required information.

      - **Via Email** — validate your license information by sending an email to NetBrain.

        > **Note:** Only use this activation method when your NetBrain Web/Web API Server is not allowed to access the Internet.

        a) Follow the instructions to generate your license file. Attach the file to your email and send it to NetBrain Support Team. After receiving your email, the NetBrain team will fill in the license information on NetBrain License Server and generate the corresponding activation file, and then send it back to you.

        b) Click **Browse** to select the activation file that you received from the NetBrain team, and then click **Activate**.

   4) A message box will prompt you the subscription license has been activated successfully. Click **OK**.

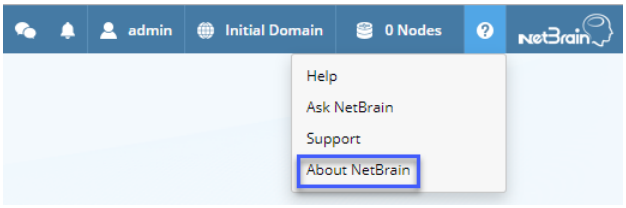
3. A confirmation dialog box prompts to ask you whether to generate an initial tenant. Click **Yes** and the initial tenant will be created automatically with all purchased nodes assigned.

1.17. Verifying Upgrade Results

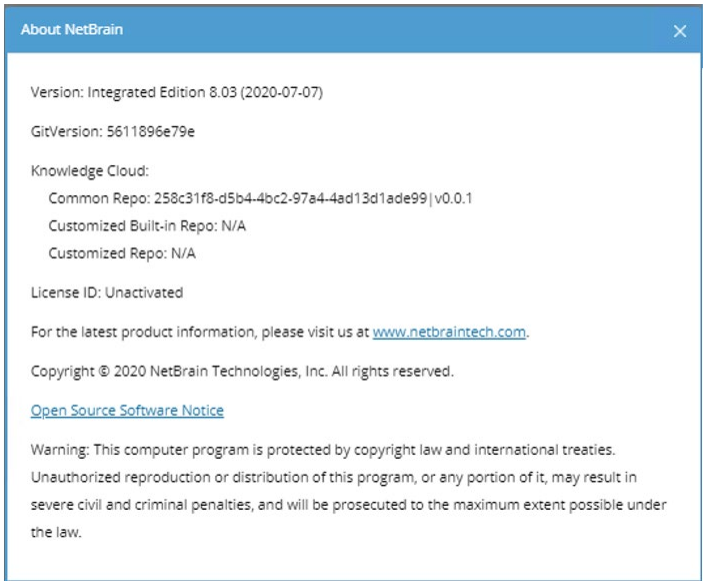
1. Do the following steps to check the IE version in web browser:

> **Note:** It is highly recommended to clear your web browser's cache before reloading the IE web page.

   1) In the system Management page, click the icon and select **About NetBrain** from the quick access toolbar.



   2) Check the version information.



2. Do the following steps to check the system version in MongoDB:

   1) Log in to the Linux server where MongoDB is installed.
   2) Open a command prompt and run the `mongo --host <IP or hostname of MongoDB Server:Port> -u <username> -p <password> --authenticationDatabase <database_name> --authenticationMechanism SCRAM-SHA-256` command to connect to MongoDB.

      Example:

```
[root@localhost ~]# mongo --host 10.10.3.142:27017 -u mongodb -p mongodb --
authenticationDatabase admin --authenticationMechanism SCRAM-SHA-256
MongoDB shell version v4.0.6
connecting to: mongodb://10.10.3.142:27017/?authMechanism=SCRAM-SHA-
256&authSource=admin&gssapiServiceName=mongodb
...
```

> **Tip:** If SSL is enabled, run the `mongo --host <IP or hostname of MongoDB Server:Port> -u <username> -p <password> --authenticationDatabase <database_name> --ssl --sslAllowInvalidCertificates --authenticationMechanism SCRAM-SHA-256` command.

3) Run the `use NGSystem` command to switch to the **NGSystem** database.

```
rsnetbrain:PRIMARY> use NGSystem
switched to db NGSystem
```

4) Run the `db.SystemInfo.find({_id: "SystemVersion"})` command to check the system version number.

```
rsnetbrain:PRIMARY> db.SystemInfo.find({_id: "SystemVersion"})
{ "_id" : "SystemVersion", "version" : "8.0.03", "operateInfo" : { "opUser" : "NetBrain",
"opTime" :
  ISODate("2020-07-14T18:31:21.735") } }
```

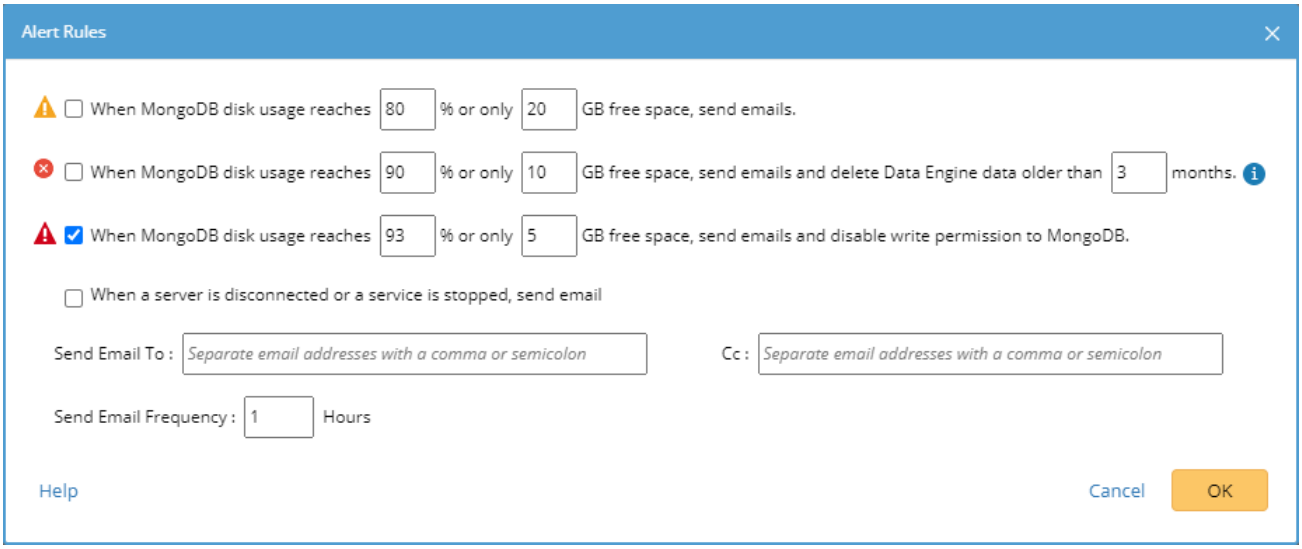
5) Run the `exit` command to exit the command prompt.

1.18. Customizing MongoDB Disk Alert Rules

To proactively prevent the system database from data loss or even corruption, you can customize MongoDB disk alert rules with progressive quotas assigned. When the MongoDB usage reaches the predefined threshold, specified users can be notified by both email alerts and system alerts.

1. In the System Management page, click **Operations > Service Monitor** from the quick access toolbar.

2. In the Service Monitor home page, click **Alert Rules** at the upper-right corner. The default settings are as follows:



3. Change the settings based on your needs.
   1) Specify the disk usage threshold for different levels.

      > **Note:** To email alerts when a server is disconnected or a service is stopped, select the corresponding check box.

   2) Enter the email address in the **Send Email To** or **CC** fields.

      > **Note:** Email alerts are enabled only when email addresses are added at least in one field. Use a colon or semicolon to separate multiple items.

   3) Specify the frequency to send emails.
   4) Click **OK** to save the configuration.

1.19. Tuning Live Access

To tune live access, complete the following steps:

1. In your web browser, navigate to **http(s)://<IP address of NetBrain Web Server>/** to log in to your domain.
2. Click the domain name from the quick access toolbar and select **Manage Domain**.
3. In the Domain Management page, select **Operations > Advanced Tools > Tune Live Access** from the quick access toolbar. The **Tune Live Access** tab opens with all devices in the domain listed.
4. Click **Start Tuning**.

5. When the tuning process is completed, a notification message is displayed. Click **OK**.

1.20. Scheduling Benchmark Task

1. In the Domain Management page, select **Operations > Schedule Task** from the quick access toolbar.
2. On the **Schedule Task > Schedule Discovery/Benchmark** tab, select the **Enable** check box for the **Basic System Benchmark** entry.
3. Click the icon to select the **Run Now** option from the drop-down list to run the benchmark task immediately.

> **Note:** If you have multiple Front Servers, go to **Operations > Benchmark Tools > CheckPoint OPSEC Manager** to specify the target Front Server to access your CheckPoint firewalls and retrieve live data.

2. Appendix: Editing a File with VI Editor

The following steps illustrate how to edit a configuration file with the vi editor, which is the default text file editing tool of a Linux operating system.

1. Create a terminal and run the `cd` command at the command line to navigate to the directory where the configuration file is located.
2. Run the `vi <configuration file name>` command under the directory to show the configuration file.
3. Press the **Insert** or **I** key on your keyboard, and then move the cursor to the location where you want to edit.
4. Modify the file based on your needs, and then press the **Esc** key to exit the input mode.
5. Enter the `:wq!` command and press the **Enter** key to save the changes and exit the vi editor.

3. Appendix: Offline Installing Third-party Dependencies

1. Download the dependency package from a server with the Internet access using one of the following download links according to the version of your Operating System:
   - **CentOS7.5:** http://download.netbraintech.com/dependencies-centos7.5-8.0.tar.gz
   - **CentOS7.6:** http://download.netbraintech.com/dependencies-centos7.6-8.0.tar.gz
   - **CentOS7.7:** http://download.netbraintech.com/dependencies-centos7.7-8.0.tar.gz
   - **CentOS7.8:** http://download.netbraintech.com/dependencies-centos7.8-8.0.tar.gz
   - **CentOS7.9:** http://download.netbraintech.com/dependencies-centos7.9-8.0.tar.gz
   - **RHEL7.5:** http://download.netbraintech.com/dependencies-rhel7.5-8.0.tar.gz
   - **RHEL7.6:** http://download.netbraintech.com/dependencies-rhel7.6-8.0.tar.gz
   - **RHEL7.7:** http://download.netbraintech.com/dependencies-rhel7.7-8.0.tar.gz
   - **RHEL7.8:** http://download.netbraintech.com/dependencies-rhel7.8-8.0.tar.gz
   - **RHEL7.9:** http://download.netbraintech.com/dependencies-rhel7.9-8.0.tar.gz
2. Copy the downloaded dependency package to your Linux server.
3. Run the `tar -zxvf dependencies-<OS version>-8.0.tar.gz` command to decompress the package.

   > **Tip:** Possible values of **OS version** include: `centos7.5`; `centos7.6`; `centos7.7`; `centos7.8`; `rhel7.5`; `rhel7.6`; `rhel7.7`; `rhel7.8`.

4. Run the `cd dependencies` command to navigate to the decompressed directory.
5. Run the `offline-install.sh` command to install the dependencies.

4. Appendix: Restoring MongoDB Data

If you encounter data loss or corruption during the upgrade process, complete the following steps to restore MongoDB data with the backup data.

1. Log in to the Linux server where the MongoDB is installed as the **root** user.

2. Stop the MongoDB Service.
   1) Run the `systemctl stop mongod` command to stop the MongoDB service.
   2) Run the `ps -ef|grep mongod` command to verify whether the **mongod** process is stopped.

```
[root@localhost ~]# ps -ef| grep mongod
root     15136 14237  0 10:42 pts/2    00:00:00 grep --color=auto mongod
```

> **Note:** If the **mongod** process is stopped, the result should only contain one entry as shown above.

3. Restore the old data onto the MongoDB.
   1) Run the `cd /usr/lib/mongodb` command to navigate to the **/usr/lib/mongodb** directory.

> **Note:** If you modified the following default directory to store all MongoDB data files during the MongoDB installation, you must use the new directory (available in the **mongod.conf** file) accordingly. For an upgraded system, e.g., upgraded from IEv7.x, the default directory is **/opt/mongodb**.

   2) Run the `ls -al` command to browse all directories and files under the **/usr/lib/mongodb** directory.

```
[root@localhost mongodb]# ls -al
total 142
drwxr-xr-x. 5 netbrain netbrain   146 Oct 19 15:02 .
drwxr-xr-x. 4 root     root        42 Sep 19 14:41 ..
drwxr-xr-x. 4 root     root        42 Oct 19 15:03 data
drwxr-xr-x. 4 root     root       100 Oct 19 15: 03 log
-rwxr-xr-x. 2 netbrain netbrain  1004 Aug 25 17: 26 mongodb-keyfile
-rwxr-xr-x. 1 netbrain netbrain  1076 Oct 19 15:02 mongod.conf
```

   3) Run the `rm -rf ./data` command to delete the **data** directory.

   4) Run the `mv /etc/mongodb_databk/data` command under the **/usr/lib/mongodb** directory to move the data directory to the **/opt/mongodb** directory.

   5) Run the `ls -al` command to browse all directories and files under the **/usr/lib/mongodb** directory.

```
[root@localhost mongodb]# ls -al
total 142
drwxr-xr-x. 5 netbrain netbrain   146 Oct 19 15:02 .
drwxr-xr-x. 4 root     root        42 Sep 19 14:41 ..
drwxr-xr-x. 4 root     root     86016 Oct 19 15: 03 data
```

```
drwxr-xr-x. 4 root     root       100 Oct 19 15: 03 log
-rwxr-xr-x. 2 netbrain netbrain  1004 Aug 25 17: 26 mongodb-keyfile
-rwxr-xr-x. 1 netbrain netbrain  1076 Oct 19 15:02 mongod.conf
-rwxr-xr-x. 1 netbrain netbrain  1147 Oct 19 14:51 mongod.conf2017|Oct|19|10:15:50
```

4. Run the `systemctl mongod start` command to restart the MongoDB service.

5. Run the `mongo --host <IP or hostname of MongoDB Server:Port> -u <username> -p <password> --authenticationDatabase <database_name>` command to connect to the node.

Example:

```
[root@localhost upgrade_replica_set]# mongo --host 10.10.3.142:27017 -u mongodb -p mongodb --
authenticationDatabase admin --authenticationMechanism SCRAM-SHA-256
MongoDB shell version v4.0.6
connecting to: mongodb://10.10.3.142:27017/?authMechanism=SCRAM-SHA-
256&authSource=admin&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("0315bda2-73f3-4304-9166-c008b9b06ce3") }
MongoDB server version: 4.0.6
...
rsnetbrain:PRIMARY>
```

> **Tip:** If SSL is enabled, run the command `mongo --host <IP or hostname of MongoDB Server:Port> -u <username> -p <password> --authenticationDatabase <database_name> --ssl --sslAllowInvalidCertificates` command.

5. Appendix: Dumping MongoDB Data

The built-in MongoDB command `mongodump` is a simple and efficient tool for backing up a small volume of MongoDB data. However, for a large volume of data, it is more time-consuming than using the `cp` command introduced in Backing Up MongoDB Data.

> **Note:** Make sure the service of MongoDB is running when you run the `mongodump` command.
>
> **Note:** The dumped data can be used to restore data in any server.

1. Log in to the Linux server where the MongoDB is installed as **root** user.
2. Open a command prompt and run the `[root@localhost ~]# mkdir /etc/mongodb_databk` command to create a directory under the **/etc** directory to save the backup data.
3. Run the `mongodump --host <ip>:<port> -u <username> -p <password> --authenticationDatabase <database_name> --gzip --out <filepath>` command to dump the MongoDB data to the **/etc/mongodb_databk** directory.

   Example:

   ```
   [root@localhost ~]# mongodump --host 127.0.0.1:27017 -u mongodb -p mongodb --
   authenticationDatabase admin --gzip --out /etc/mongodb_databk
   ```

   > **Tip:** If SSL is enabled, run the `mongodump --host <ip>:<port> -u <username> -p <password> --authenticationDatabase <dbname> --ssl --sslAllowInvalidCertificates --gzip --out <filepath>` command.

4. Verify the backup result.
   1) Run the `cd /etc/mongodb_databk` command to navigate to the **/etc/mongodb_databk** directory.
   2) Run the `ls -al` command under the **mongodb_databk** directory to browse the backup data.

Restoring Dumped MongoDB Data

Restore the dumped data by using the `mongorestore` command provided by MongoDB.

> **Note:** Make sure the service of MongoDB is running when you run the `mongorestore` command.
>
> **Note:** Make sure other relevant services are stopped.

To restore the dumped MongoDB data onto the MongoDB server, run the `mongorestore --host <ip>:<port> -u <username> -p <password> --authenticationDatabase <database_name> --gzip --out <filepath>` command.

Example:

```
[root@localhost ~]# mongorestore --host 127.0.0.1:27017 -u mongodb -p mongodb --
authenticationDatabase admin --gzip --out /etc/mongodb_databk
```

> **Tip:** If SSL is enabled, run the `mongorestore --host <ip>:<port> -u <username> -p <password> --authenticationDatabase <dbname> --ssl --sslAllowInvalidCertificates --gzip --out <filepath>` command.