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1. Upgrading NetBrain 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

<table>
<thead>
<tr>
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<th>Destination</th>
<th>Protocol and Port Number *)</th>
</tr>
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<tr>
<td>Thin Client</td>
<td>Web Server</td>
<td>HTTP/HTTPS (80/443)</td>
</tr>
<tr>
<td></td>
<td>Web API Server</td>
<td></td>
</tr>
<tr>
<td>Service Monitor Agent</td>
<td>Web API Server</td>
<td>HTTP/HTTPS (80/443)</td>
</tr>
<tr>
<td>Web API Server</td>
<td>Knowledge Cloud Domain</td>
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</tr>
<tr>
<td></td>
<td>(<a href="https://knowledgecloud.netbraintech.com/">https://knowledgecloud.netbraintech.com/</a>)</td>
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<tr>
<td>Web API Server</td>
<td>MongoDB</td>
<td>TCP 27017</td>
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<td>Worker Server</td>
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<td>Live Network</td>
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</tr>
</tbody>
</table>

**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 into System Management page.
2. Select the **Task Manager** tab.
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, you must stop the following relevant services:

1. Log in to the Windows servers and stop the following services in the Task Manager.
   - **W3SVC** (Web API Server service)
   - **WAS** (Web API Server service)

   **NetBrain Components** | **Service Name in v7.1x**
   --- | ---
   Redis | RedisMaster
   RabbitMQ | RabbitMQ
   Worker Server | NetBrainWorkerServer
   Front Server | NetBrainFrontServer
   Task Engine | NetBrainTaskEngine
   Front Server Controller | NetBrainFrontServerController

2. Disable the **Cron** task on the MongoDB. 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
   ```

   **Note:** Take note of the MongoDB service name (highlighted) in the script as it will be used in the command to stop the MongoDB service in Step 3.

   **Note:** The default name of the MongoDB service varies by different NetBrain system versions. In v7.0b/b1 system, MongoDB service name is `mongodnetbrain`; starting from v7.1, MongoDB service name is `mongod`.

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 NetBrain Integrated Edition, 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 Appendix: 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, see Appendix: Dumping MongoDB data for another way to back up the data, and see Appendix: Restoring Dumped MongoDB data to restore the data.

The following section 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 `service <mongodb service name> stop` command to stop the MongoDB service.
      
      Note: The default name of the MongoDB service varies by different NetBrain system versions. In v7.0b/b1 system, MongoDB service name is `mongodnetbrain`; starting from v7.1, MongoDB service name is `mongod`.
      
      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.
      
      Tip: You can always confirm the MongoDB service name by executing the `crontab -l` command.

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

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

3. Run the following command to create a directory under the `/etc` directory to save the backup data.
4. 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 `mongod.conf`) accordingly.

   - For an upgraded system, e.g., upgraded from IEv7.x, the default directory is `/opt/mongodb`.
   - For a freshly installed system, the default directory is `/usr/lib/mongodb`.

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.

   **Note:** The default name of the MongoDB service varies by different NetBrain system versions. In v7.0b/b1 system, MongoDB service name is `mongodnetbrain`; starting from v7.1, MongoDB service name is `mongod`.

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.

9. Run the `service <mongodb service name> start` command to start the MongoDB service.

**1.4. Upgrading MongoDB**

**Pre-Upgrade Task**

- Ensure you have upgraded your OS to **Red Hat Enterprise Linux Server 7.5/7.6/7.7, 64-bit** or **CentOS 7.5/7.6/7.7, 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, don’t 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, `netbraintemp`.

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

3. Run the `cd /opt/netbraintemp` command to navigate to the `/opt/netbraintemp` directory.

4. Download the installation package.

   - **Option 1:** If the Linux server has no access to the Internet, obtain the `mongodb-linux-x86_64-rhel7-4.0.6-8.0.2.tar.gz` file from NetBrain and upload it to the `/opt/netbraintemp` 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-rhel7-4.0.6-8.0.2.tar.gz` command under the `/opt/netbraintemp` directory to directly download the `mongodb-linux-x86_64-rhel7-4.0.6-8.0.2.tar.gz` file from NetBrain official download site.

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

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

5. Run the `tar -zxvf mongodb-linux-x86_64-rhel7-4.0.6-8.0.2.tar.gz` command under the `/opt/netbraintemp` directory to extract installation files.

```bash
[root@centos netbraintemp]# tar -zxvf mongodb-linux-x86_64-rhel7-4.0.6-8.0.2.tar.gz
MongoDB/
MongoDB/config/
...
MongoDB/upgrade/upgrade_single_node/
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 `service mongod start` command to restart the MongoDB service.

   **Note:** The default name of the MongoDB service varies by different NetBrain system versions. In v7.0b/b1 system, MongoDB service name is `mongodnetbrain`; starting from v7.1, MongoDB service name is `mongod`.

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 Tue 2020-01-14 00:43:32 EST; 4min 32s ago
   Process: 6136 ExecStart=/bin/mongod -f /etc/mongodb/mongod.conf (code=exited, status=0/SUCCESS)
   Main PID: 6375 (mongod)
   Memory: 902.3M (limit: 8.0G)
   ...
   ```

   **Tip:** It is highly recommended to run the `rm -rf /opt/netbraintemp/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 your OS to **Red Hat Enterprise Linux Server 7.5/7.6/7.7, 64-bit** or **CentOS 7.5/7.6/7.7, 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, don't 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, `netbraintemp`.

3. Run the `cd /opt/netbraintemp` command to navigate to the `/opt/netbraintemp` directory.

4. Download the installation package.
   - **Option 1:** If the Linux server has no access to the Internet, obtain the `elasticsearch-linux-x86_64-rhel7-6.7.2-8.0.2.tar.gz` file from NetBrain and then upload it to the `/opt/netbraintemp` 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-rhel7-6.7.2-8.0.2.tar.gz` command under the `/opt/netbraintemp` directory to directly download the `elasticsearch-linux-x86_64-rhel7-6.7.2-8.0.2.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-rhel7-6.7.2-8.0.2.tar.gz` command under the `/opt/netbraintemp` directory to extract installation files.

   ```bash
   [root@centos netbraintemp]# tar -zxvf elasticsearch-linux-x86_64-rhel7-6.7.2-8.0.2.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 Tue 2020-01-14 00:43:41 EST; 27min ago
 Docs: http://www.elastic.co
 Main PID: 5922 (java)
 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" : "2020-06-06T18:41:22.859Z",
    "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/netbraintemp/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 your OS to Red Hat Enterprise Linux Server 7.5/7.6/7.7, 64-bit or CentOS 7.5/7.6/7.7, 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, don't 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, netbraintemp.

3. Run the cd /opt/netbraintemp command to navigate to the /opt/netbraintemp 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-rhel7-8.0.2.tar.gz file from NetBrain and then upload it to the /opt/netbraintemp 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-rhel7-8.0.2.tar.gz command under the /opt/netbraintemp directory to directly download the netbrain-licenseagent-linux-x86_64-rhel7-8.0.2.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-licenseagent-linux-x86_64-rhel7-8.0.2.tar.gz command under the /opt/netbraintemp directory to extract installation files.

   [root@localhost netbraintemp]# tar -zxvf netbrain-licenseagent-linux-x86_64-rhel7-8.0.2.tar.gz
   License/
   License/config/
   License/config/install_licenseagent.conf
   License/config/setup.conf
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: Collecting system information SUCCEEDED.
INFO: Starting to check Linux OS info
INFO: Starting to check rpm exists
INFO: System checking SUCCEEDED
INFO: Dependent packages checking SUCCEEDED
```

```
Successfully installed NetBrain License Agent package.
INFO: Rpm package installing SUCCEEDED.
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 Tue 2020-01-14 00:43:41 EST; 27min ago
     Process: 6054 ExecStart=/usr/bin/netbrainlicense/licensed -f
             /etc/netbrainlicense/licensed.conf (code=exited, status=0/SUCCESS)
     Process: 5907 ExecStartPre=/bin/chmod o+r /sys/class/dmi/id/product_uuid (code=exited, status=0/SUCCESS)
 Main PID: 6138 (licensed)
     Memory: 8.2M
```
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 your OS to Red Hat Enterprise Linux Server 7.5/7.6/7.7, 64-bit or CentOS 7.5/7.6/7.7, 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, don't 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, `netbraintemp`.
3. Run the `cd /opt/netbraintemp` command to navigate to the `/opt/netbraintemp` directory.
4. Download the installation package.
   - **Option 1:** If the Linux server has no access to the Internet, obtain the `redis-linux-x86_64-rhel7-5.0.4-8.0.2.tar.gz` file from NetBrain and then upload it to the `/opt/netbraintemp` 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-rhel7-5.0.4-8.0.2.tar.gz
```

command under the `/opt/netbraintemp` directory to directly download the `redis-linux-x86_64-rhel7-5.0.4-8.0.2.tar.gz` file from NetBrain official download site.

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

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

5. Run the `tar -zxvf redis-linux-x86_64-rhel7-5.0.4-8.0.2.tar.gz` command under the `/opt/netbraintemp` directory to extract installation files.

```
[root@localhost netbraintemp]# tar -zxvf redis-linux-x86_64-rhel7-5.0.4-8.0.2.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, see Appendix: Editing a File with VI Editor for more details.

```
[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'. sentinel will be installed onto slave node)
NodeRole=master
#Master Node (Master Node can support ip address 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.
  this is needed only for slave node.
  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/redis-server.crt
  PrivateKey=/etc/ssl/redis-server.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 \texttt{cd ..} command to navigate to the \texttt{redis} directory.

9. Run the \texttt{./install.sh} script under the \texttt{redis} directory to install Redis.

```
[root@localhost redis]# ./install.sh
INFO: checking root
INFO: Creating log file
INFO: checking date
INFO: Preprocessing \texttt{SUCCEEDED}
INFO: Starting to check system
  Collecting system information...
...
  Collecting system information \texttt{SUCCEEDED}.
INFO: Starting to check Linux OS info
INFO: Starting to check rpm exists
INFO: Starting to check systemd
INFO: Starting to check required CPU
INFO: Starting to check minimum memory
INFO: System checking \texttt{SUCCEEDED}
INFO: Dependent packages checking \texttt{SUCCEEDED}
INFO: checking password
INFO: checking useSSL
INFO: checking ResourceLimit
INFO: checking Port
INFO: Mode is standalone
INFO: Role of node is master
INFO: Port 6379 is available
INFO: Add port 6379 into firewall successfully
INFO: Configuration parameters checking \texttt{SUCCEEDED}
```
INFO: Installing /opt/netbraintemp/redis/sources/redis-5.0.4-1.el7.x86_64.rpm
Preparing... ################################################################################
Updating / installing...
redis-5.0.4-1.el7 ################################################################################
INFO: Official rpm package installing SUCCEEDED
INFO: Configuration parameters updating SUCCEEDED
INFO: Permission assigning SUCCEEDED
vm.overcommit_memory = 1
net.core.somaxconn = 1024
never /sys/kernel/mm/transparent_hugepage/enabled
redis.service - Redis
  Loaded: loaded (/usr/lib/systemd/system/redis.service; enabled; vendor preset: disabled)
  Active: active (running) since Tue 2020-01-14 00:38:49 EST; 37min ago
Main PID: 56299 (redis-server)
  Memory: 1.2M
  CGroup: /system.slice/redis.service
        56299 /sbin/redis-server *:6379

May 05 03:19:26 localhost.localdomain systemd[1]: Started Redis.
INFO: Checking redis Status :
  Active: active (running) since Tue 2020-01-14 00:38:49 EST; 37min ago
INFO: Verification SUCCEEDED
INFO: Successfully installed Redis
INFO: Backup uninstall.sh 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 Tue 2020-01-14 00:38:49 EST; 37min ago
Main PID: 52318 (redis-server)
  Memory: 7.7M
...
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Value</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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. |
| MasterNode  |               | This parameter is required only 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 SSL service agent. Stunnel will be automatically installed together with Redis. |
| Certificate | /etc/ssl/redis-server.crt | 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/redis-server.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 master and slave Redis node.  
  **Note:** It is required only if `UseSSL` is enabled. |
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Value</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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 your OS to Red Hat Enterprise Linux Server 7.5/7.6/7.7, 64-bit or CentOS 7.5/7.6/7.7, 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, don't 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.

Note: 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.

## Installing RabbitMQ on Linux

Note: 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` command to check whether socat and logrotate have been installed on the server. If it has not been installed, you can choose either option below to install the dependencies.

- **Online Install:** run the `yum -y install socat` and `yum -y install logrotate` command to install them online.
- **Offline Install:** see Appendix for more details.

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, netbraintemp.
3. Run the `cd /opt/netbraintemp` command to navigate to the /opt/netbraintemp directory.
4. Download the installation package.
   - **Option 1:** If the Linux server has no access to the Internet, obtain the rabbitmq-linux-x86_64-rhel7-3.8.1-8.0.2.tar.gz file from NetBrain and then upload it to the /opt/netbraintemp 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-rhel7-3.8.1-8.0.2.tar.gz` command under the /opt/netbraintemp directory to directly download the rabbitmq-linux-x86_64-rhel7-3.8.1-8.0.2.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-rhel7-3.8.1-8.0.2.tar.gz` command under the /opt/netbraintemp directory to extract installation files.

```bash
[root@localhost netbraintemp]# tar -zxvf rabbitmq-linux-x86_64-rhel7-3.8.1-8.0.2.tar.gz rabbitmq/
```
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, see Appendix: Editing a File with VI Editor for more details.

```
[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/rabbitmq/cert.pem
KeyFile=/etc/ssl/rabbitmq/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.
INFO: Creating installation log file
INFO: Preprocessing SUCCEEDED
INFO: Start checking system
   Collecting system information...
   ...  
   Collecting system information SUCCEEDED.
   ...
warning: /opt/netbraintemp/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-21.2.4-1.el7.centos #.................................................................
INFO: Installing /opt/netbraintemp/rabbitmq/sources/rabbitmq-server-3.8.1-1.el7.noarch.rpm
warning: /opt/netbraintemp/rabbitmq/sources/rabbitmq-server-3.8.1-1.el7.noarch.rpm: Header V4 RSA/SHA1
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 SUCCEEDED
INFO: Deamon setting SUCCEEDED
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 Tue 2020-01-14 00:38:43 EST; 36min ago
   Main PID: 53927 (beam.smp)
   Status: "Initialized"
   Memory: 70.8M (limit: 15.5G)
   CGroup: /system.slice/rabbitmq-server.service
   53927 /usr/lib64/erlang/erts-10.2.3/bin/beam.smp -W w -A 128 -MBas ageffcbf -MHas ageffcbf
   -MBLmbcs 512 -MHLmbcs 512 -MMhmc 30 -p 1048576 -t 5000000 -stbt db -zdbbl 1280000 -K true
   -- -root /usr/lib64/erlang -proname erl -- -home /var/lib/rabbitmq -- -p...
   54068 /usr/lib64/erlang/erts-10.2.3/bin/epmd -daemon
   54315 erl_child_setup 1024
   54344 inet_gethost 4
   54345 inet_gethost 4
   54360 /usr/bin/socat unix-sendto:/run/systemd/notify STDIO

Mar 17 21:14:36 localhost.localdomain systemd[1]: Starting RabbitMQ broker...
Mar 17 21:14:39 localhost.localdomain rabbitmq-server[53927]: ## ##
Copyright (C) 2007-2018 Pivotal Software, Inc.
Mar 17 21:14:39 localhost.localdomain rabbitmq-server[53927]: ############ Licensed under the
MPL.
See http://www.rabbitmq.com/
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 Tue 2020-01-14 00:38:43 EST; 36min ago
   Main PID: 4509 (beam.smp)
       Status: "Initialized"
       Memory: 96.5M
```

Tip: It is highly recommended to run the `rm -rf /opt/netbraintemp/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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Username</td>
<td>admin</td>
<td>Specify the admin username used to connect to RabbitMQ. <strong>Note:</strong> The username and password cannot contain any of the following special characters, and its length cannot exceed 64 characters. <code>{ } [ ] : &quot; ' &lt; &gt; @ &amp; ^ % \ and spaces</code></td>
</tr>
<tr>
<td>Password</td>
<td>admin</td>
<td>Specify the admin password used to connect to RabbitMQ.</td>
</tr>
<tr>
<td>Mode</td>
<td>standalone</td>
<td>Set whether to enable cluster deployment. Modify it to <code>standalone</code> for a standalone deployment.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Default Value</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ClusterId</td>
<td>rabbitmqcluster</td>
<td>Specify the cluster id used by all nodes to join the cluster.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note</strong>: This parameter is required only for cluster deployments.</td>
</tr>
<tr>
<td>NodeRole</td>
<td>master</td>
<td>Set the role for the current node. Available options are master and slave. Keep the default value for a standalone deployment.</td>
</tr>
<tr>
<td>MasterNode</td>
<td>localhost</td>
<td>This parameter is required only for cluster deployments. Keep the default value as it is for a standalone deployment.</td>
</tr>
<tr>
<td>ResourceLimit</td>
<td><strong>no</strong></td>
<td>Set whether to limit the system resource usage for RabbitMQ.</td>
</tr>
<tr>
<td>CPULimit</td>
<td>100%</td>
<td>Specify the maximum CPU utilization of the machine that can be consumed by RabbitMQ.</td>
</tr>
<tr>
<td>MemoryLimit</td>
<td>100%</td>
<td>Specify the maximum memory capacity of the machine that can be consumed by RabbitMQ.</td>
</tr>
<tr>
<td>UseSSL</td>
<td><strong>no</strong></td>
<td>Set whether to enable the encrypted connections to RabbitMQ by using SSL.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Follow steps below to modify RabbitMQ Plugin config file if UseSSL is set to yes:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1) Run the <code>vi /etc/netbrain/nbagent/check/rabbitmq.yaml</code> command to open RabbitMQ Plugin config file.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) Set the <code>ssl</code> value to true and save the changes. For how to modify the configuration file, see Appendix: Editing a File with VI Editor for more details.</td>
</tr>
<tr>
<td>Certificate</td>
<td>/etc/ssl/cert.pem</td>
<td>Specify the storage path for all the certificates and key files used for SSL authentication.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note</strong>: It is required only if UseSSL is enabled.</td>
</tr>
<tr>
<td>PrivateKey</td>
<td>/etc/ssl/key.pem</td>
<td>Specify the name of SSL private key file.</td>
</tr>
</tbody>
</table>
### Parameter Settings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TcpPort</td>
<td>5672</td>
<td>Specify the port number that RabbitMQ service listens to.</td>
</tr>
<tr>
<td>LogPath</td>
<td>/var/log/rabbitmq</td>
<td>Specify the directory to save logs of RabbitMQ.</td>
</tr>
</tbody>
</table>

**Note:** It is required only if UseSSL is enabled.

### 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

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_64-8.0.2.zip** file from [http://download.netbraintech.com/netbrain-ie-windows-x86_64-8.0.2.zip](http://download.netbraintech.com/netbrain-ie-windows-x86_64-8.0.2.zip) and save it in your local folder.
2. Extract installation files from the **netbrain-ie-windows-x86_64-8.0.2.zip** file.
3. Right-click the **netbrain-ie-windows-x86_64-8.0.2.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. .NET Framework 4.8 must be pre-installed on this machine before you upgrade the Web/Web API Server. The Installation Wizard will automatically check this dependency. If it has not been installed, the wizard
will guide you through the installation as follows; it has been installed, the wizard will directly go to step 3).

**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.

a) Click **Install**.

b) Read the license agreement of Microsoft .NET Framework 4.8, select the **I have read and accept the license terms** check box and click **Install**. It might take a few minutes for the installation to be completed.

**Note:** Some running applications must be closed during the installation of .NET Framework 4.8, such as Server Manager.
c) After .NET Framework 4.8 is successfully installed, click **Finish** to exit the wizard.

![Finish](image)

d) You must click **Restart Now** to restart the machine immediately. Otherwise, the upgrade will fail due to the failure of upgrading the new .Net Framework. After the machine reboots, continue with the next step.

![Restart Now](image)

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.

![Yes](image)

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 License Agent, and then click **Next**.

10) On the Elasticsearch Connection page, enter the password that you created when installing 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 CA certificate file 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** to complete the upgrade process and exit the Installation Wizard.

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 **NBIEInstall** folder from the \C:\ drive of this machine directly to the \C:\ drive of the machines where Worker Server, Task Engine, and Front Server Controller will be installed.

---

### Post-Upgrade Task

Uninstall **NetBrain Update Server** from Windows Control Panel.

---

### 1.10. Upgrading Worker Server

**Note:** If you have deployed a Worker Server Cluster for load balancing, you can repeat the following 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.

Complete the following steps with administrative privileges.

1. Download the **netbrain-ie-windows-x86_64-8.0.2.zip** file from [http://download.netbraintech.com/netbrain-ie-windows-x86_64-8.0.2.zip](http://download.netbraintech.com/netbrain-ie-windows-x86_64-8.0.2.zip) and save it in your local folder.

2. Extract installation files from the **netbrain-ie-windows-x86_64-8.0.2.zip** file.

3. Right-click the **netbrain-ie-windows-x86_64-8.0.2.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) .NET Framework 4.8 must be pre-installed on this machine before you upgrade the Worker Server. The Installation Wizard will automatically check this dependency. If it has not been installed, the wizard will guide you through the installation as follows; it has been installed, the wizard will directly go to step 3).
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.

a) Click **Install**.

![NetBrain Integrated Edition All Packages - InstallShield Wizard](image)

b) Read the license agreement of Microsoft .NET Framework 4.8, select the **I have read and accept the license terms** check box and click **Install**. It might take a few minutes for the installation to be completed.

![Microsoft .NET Framework](image)

Note: Some running applications must be closed during the installation of .NET Framework 4.8, such as Server Manager.
c) After .NET Framework 4.8 is successfully installed, click **Finish** to exit the wizard.

![Finish](image1)

d) You must click **Restart Now** to restart the machine immediately. Otherwise, the upgrade will fail due to the failure of upgrading the new .Net Framework. After the machine reboots, continue with the next step.

![Restart Now](image2)

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

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

![Yes](image3)

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 License Agent, and then click Next.

10) On the Elasticsearch Connection page, enter the password that you created when installing 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 CA certificate file 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.
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 Worker Server on your machine, click **Finish** to complete the upgrade process and exit the Installation Wizard.

6. Open the Task Manager and navigate to the Services panel to check that the **NetBrainWorkerServer** is running.

7. If you deployed a Worker Server Cluster for load balancing, repeat the above steps on other machines for an upgrade.

**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

Complete the following steps with administrative privileges.

1. Download the `netbrain-taskengine-windows-x86_64-8.0.2.zip` file from [http://download.netbraintech.com/netbrain-taskengine-windows-x86_64-8.0.2.zip](http://download.netbraintech.com/netbrain-taskengine-windows-x86_64-8.0.2.zip) and save it in your local folder.

2. Extract installation files from the `netbrain-taskengine-windows-x86_64-8.0.2.zip` file.

3. Right-click the `netbrain-taskengine-windows-x86_64-8.0.2.exe` file, and then select Run as administrator to start the Installation Wizard.

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

   ![NetBrain Task Engine Upgrade Confirmation](image)

   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.

   ![NetBrain Task Engine Prerequisites](image)

   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 that 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) (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 certificate file 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.

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

4. After successfully installing the Task Engine, click **Finish** to complete the installation process and exit the Installation Wizard.

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

**Post-Upgrade Tasks**

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

**Note:** Ensure the JDK 9.0.1 is not used by other applications before proceeding with the above step.
### 1.12. Upgrading Front Server Controller

Complete the following steps with administrative privileges.

1. Download the `netbrain-frontservercontroller-windows-x86_64-8.0.2.zip` file from [http://download.netbraintech.com/netbrain-frontservercontroller-windows-x86_64-8.0.2.zip](http://download.netbraintech.com/netbrain-frontservercontroller-windows-x86_64-8.0.2.zip) and save it in your local folder.

2. Extract installation files from the `netbrain-frontservercontroller-windows-x86_64-8.0.2.zip` file.

3. Right-click the `netbrain-frontservercontroller-windows-x86_64-8.0.2.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 that 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**.

![NetBrain Front Server Controller - InstallShield Wizard](image)

9) (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 certificate file and then click **Next**.

![NetBrain Front Server Controller - InstallShield Wizard](image)

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

![KeyVault Administration Passphrase Settings](image)

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

4. After successfully upgrading the Front Server Controller, click **Finish** to complete the upgrade process and exit the Installation Wizard.

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 the Front Server, depending on your operating system:

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

#### 1.13.1. Upgrading Front Server on Linux

**Pre-Upgrade Task**

Ensure you have upgraded your OS to **Red Hat Enterprise Linux Server 7.5/7.6/7.7, 64-bit** or **CentOS 7.5/7.6/7.7, 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, don't 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 Front Server on Linux

Note: 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.

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, `netbraintemp`.

3. Run the `cd /opt/netbraintemp` command to navigate to the `/opt/netbraintemp` 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-rhel7-8.0.2.tar.gz` file from NetBrain and then upload it to the `/opt/netbraintemp` 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-rhel7-8.0.2.tar.gz` command under the `/opt/netbraintemp` directory to directly download the `netbrain-frontserver-linux-x86_64-rhel7-8.0.2.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-rhel7-8.0.2.tar.gz` command under the `/opt/netbraintemp` directory to extract installation files.

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: Starting to check date...
INFO: Starting to check Linux OS info...
INFO: Starting to check systemd service...
INFO: Starting to check required CPU...
INFO: Starting to check minimum memory...
INFO: System checking SUCCEEDED
INFO: Dependent packages checking SUCCEEDED
INFO: Configuration parameters checking SUCCEEDED
INFO: Current working directory: /root/p802/Frontserver
INFO: Installing Front Server SUCCEEDED
Usermod: no changes
INFO: Configuration parameters updating SUCCEEDED
Created symlink from /etc/systemd/system/multi-user.target.wants/netbrainfrontserver.service to /usr/lib/systemd/system/netbrainfrontserver.service.
INFO: Successfully installed Front Server.
INFO: Backup uninstall.sh SUCCEEDED
The upgrading is successfully.
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 for an upgrade.

### 1.13.2. Upgrading Front Server on Windows

Complete the following steps with administrative privileges.
1. Download the netbrain-frontserver-windows-x86_64-8.0.2.zip file from http://download.netbraintech.com/netbrain-frontserver-windows-x86_64-8.0.2.zip and save it in your local folder.

2. Extract installation files from the netbrain-frontserver-windows-x86_64-8.0.2.zip file.

3. Right-click the netbrain-frontserver-windows-x86_64-8.0.2.exe file, and then select Run as administrator to start the Installation Wizard.

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

   ![Warning]

   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.

   ![License Agreement]

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

4. After the Front Server is successfully upgraded, click Finish to complete the upgrade process and exit the Installation Wizard. Close the pop-up registration program.

   **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 deployed multiple Front Servers for load balancing, repeat the above steps on other machines for an upgrade.
1.14. Upgrading Service Monitor Agent

Select either of the following ways to upgrade the Service Monitor Agent, depending on your 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 Task**

Ensure you have upgraded your OS to Red Hat Enterprise Linux Server 7.5/7.6/7.7, 64-bit or CentOS 7.5/7.6/7.7, 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, don't 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 Service Monitor on Linux**

*Note:* 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.

1. Log into the Linux server as the root user.

2. Run the `cd /opt/netbraintemp` command to navigate to the /opt/netbraintemp 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-rhel7-8.0.2.tar.gz file from NetBrain and then upload it to the /opt/netbraintemp directory by using a file transfer tool.
**Option 2:** If the Linux server has access to the Internet, run the
\[
\text{wget http://download.netbraintech.com/netbrain-servicemonitoragent-linux-x86_64-rhel7-8.0.2.tar.gz}
\]
command under the `/opt/netbraintemp` directory to directly download the `netbrain-servicemonitoragent-linux-x86_64-rhel7-8.0.2.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-rhel7-8.0.2.tar.gz` command under the `/opt/netbraintemp` directory to extract installation files.

```
[root@localhost netbraintemp]# tar -zxvf netbrain-servicemonitoragent-linux-x86_64-rhel7-8.0.2.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.
...
Obtaining file:///usr/share/nbagent
Installing collected packages: agent
  Running setup.py develop for agent
Successfully installed agent
```
You are using pip version 18.1, however version 19.0.3 is available. You should consider upgrading via the 'pip install --upgrade pip' command. Configuration parameters updating SUCCEEDED. Starting to permission assigning... Permission assigning SUCCEEDED. Starting to deamon setting... Deamon setting SUCCEEDED. INFO: Backing up uninstall.sh SUCCEEDED INFO: Successfully installed Service Monitor Agent. Successfully upgraded Service Monitor Agent. ... 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 Mon 2020-01-13 22:01:54 EST; 3h 15min ago
 Main PID: 4520 (python3)
   Memory: 73.5M
   ... 
```

Tip: It is highly recommended to run the `rm -rf /opt/netbraintemp/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_64-8.0.2.zip` file from [http://download.netbraintech.com/netbrain-servicemonitoragent-windows-x86_64-8.0.2.zip](http://download.netbraintech.com/netbrain-servicemonitoragent-windows-x86_64-8.0.2.zip) and save it in your local folder.

2. Extract installation files from the `netbrain-servicemonitoragent-windows-x86_64-8.0.2.zip` file.

3. Right-click the `netbrain-servicemonitoragent-windows-x86_64-8.0.2.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 NetBrain Service Monitor Agent is successfully upgraded, click **Finish** to complete the upgrade process and exit the Installation Wizard.

**Tip:** After the installation is completed, you can open the Task Manager and navigate to the **Services** panel to check whether **NetBrainAgent** is running.

### 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.
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](mailto:NetBrainSupportTeam@NetBrain.com).
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](mailto:NetBrainSupportTeam@NetBrain.com) with the file attached. NetBrain support team will help remove your license information from NetBrain License Server.

### 1.16. Activating Subscription License

1. On the **License** tab, click **Activate**.
2. Select **Online** and click **Next**.
3. Enter the license ID, activation key and required information, and click **Activate**.

**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](mailto:NetBrainSupportTeam@NetBrain.com).
1) Select **Via Email** and click **Next**.
2) Follow the instructions to generate your license file. Attach the file to your email and send it to [NetBrain Support Team](mailto:NetBrainSupportTeam@NetBrain.com). After receiving your email, 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.
3) Click **Browse** to select the activation file that you received from NetBrain team, and then click **Activate**.
4. A message box will prompt to notify you that the subscription license has been activated successfully. Click **OK**.
5. 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

**Method 1: Verify IE Version in Thin Client**

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

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

2. Check the version information.

![About NetBrain](image)

Version: Integrated Edition 8.02 (2020-02-14)

GitVersion: 7c604b9f188

Knowledge Cloud:
- Common Repo: 8e8d6d72-fb7a-392a-8b80-2b0888775cde | v0.0.4
- Customized Built-in Repo: N/A
- Customized Repo: N/A

License ID: 17210

For the latest product information, please visit us at [www.netbraintech.com](http://www.netbraintech.com).

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**Method 2: Verify System Version in MongoDB**

1. Log in to the Linux server where MongoDB is installed.

2. Open a command prompt, and run the following command to connect to MongoDB.

   ```
   mongo --host <IP or hostname of MongoDB Server:Port> -u <username> -p <password> --authenticationDatabase <database_name> --authenticationMechanism SCRAM-SHA-256
   ```
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 browse the system version number.
```
rsnetbrain:PRIMARY> db.SystemInfo.find({_id: "SystemVersion"})
```

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 need to customize MongoDB disk alert rules. When the MongoDB usage reaches the predefined threshold, specified users can be notified by both email alerts and in-place warnings in the system.

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

2. Enter the username and password, and click **Log In**.

Note: The user account of service monitor is different from the user account of NetBrain IE system. The default username/password is **admin/admin**.
3. In the home page of the Service Monitor Portal, click **MongoDB Disk Alert Rules** at the upper-right corner and configure the settings based on your needs. See [Managing MongoDB Disk Alert Rules](#) for more details.

![MongoDB Disk Alert Rules](image)

4. Click **OK**.

### 1.19. Tuning Live Access

1. In your web browser, navigate to `http(s)://<IP address of NetBrain Web Server>/` to log in to a 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 Discovery/Benchmark** tab, select the **Enable** check box for the **Basic System Benchmark** entry.

3. Click 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.
### 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](http://download.netbraintech.com/dependencies-centos7.5-8.0.tar.gz)
- CentOS7.6: [http://download.netbraintech.com/dependencies-centos7.6-8.0.tar.gz](http://download.netbraintech.com/dependencies-centos7.6-8.0.tar.gz)
- CentOS7.7: [http://download.netbraintech.com/dependencies-centos7.7-8.0.tar.gz](http://download.netbraintech.com/dependencies-centos7.7-8.0.tar.gz)
- RHEL7.5: [http://download.netbraintech.com/dependencies-rhel7.5-8.0.tar.gz](http://download.netbraintech.com/dependencies-rhel7.5-8.0.tar.gz)
- RHEL7.6: [http://download.netbraintech.com/dependencies-rhel7.6-8.0.tar.gz](http://download.netbraintech.com/dependencies-rhel7.6-8.0.tar.gz)
- RHEL7.7: [http://download.netbraintech.com/dependencies-rhel7.7-8.0.tar.gz](http://download.netbraintech.com/dependencies-rhel7.7-8.0.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`; `rhel7.5`; `rhel7.6`; `rhel7.7`.

**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

Complete the following steps to restore the MongoDB data with the backup data if you encounter data loss or corruption during the upgrade process.

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

2. Stop the MongoDB Service.

   1) Run the `service <mongodb service name> stop` command to stop the MongoDB service.

   **Note:** The default name of the MongoDB service varies by different NetBrain system versions. In v7.0b/b1 system, MongoDB service name is `mongodnetbrain`; starting from v7.1, MongoDB service name is `mongod`.

   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`.
   - For a freshly installed system, the default directory is `/usr/lib/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       100 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 `service <mongodb service name> start` command to restart the MongoDB service.

Note: The default name of the MongoDB service varies by different NetBrain system versions. In v7.0b/b1 system, MongoDB service name is `mongodnetbrain`; starting from v7.1, MongoDB service name is `mongod`.

5. Run the following commands to connect to the node:

- For IEv7.x, run the `mongo --host <IP or hostname of MongoDB Server:Port> -u <username> -p <password> --authenticationDatabase <database_name>` command.

- For IEv8.0, run the `mongo --host <IP or hostname of MongoDB Server:Port> -u <username> -p <password> --authenticationDatabase <database_name> --authenticationMechanism SCRAM-SHA-256` command.

**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 following command:

- For IEv7.x, run the `mongo --host <IP or hostname of MongoDB Server:Port> -u <username> -p <password> --authenticationDatabase <database_name> --ssl --sslAllowInvalidCertificates` command.

- For IEv8.0, 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.
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 to copy data files from the MongoDB Server directly.

**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. If you have set up a MongoDB replica set for high availability, you only need to dump data from the primary node.

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

2. Open a command prompt and run the following command to create a directory under the `/etc` directory to save the backup data.
   ```bash
   [root@localhost ~]# mkdir /etc/mongodb_databk
   ```

3. Enter the following command in one line and run it to dump the MongoDB data to the `/etc/mongodb_databk` directory.
   - For IEv7.x, run the `mongodump --host <ip>:<port> -u <username> -p <password> --authenticationDatabase <database_name> --gzip -out <filepath>` command.
   - For IEv8.0, run the `mongodump --host <ip>:<port> -u <username> -p <password> --authenticationDatabase <database_name> --authenticationMechanism SCRAM-SHA-256 --gzip -out <filepath>` command.

   **Example:**
   ```bash
   [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 following commands:
   - For IEv7.x, run the `mongodump --host <ip>:<port> -u <username> -p <password> --authenticationDatabase <dbname> --ssl --sslAllowInvalidCertificates --gzip -out <filepath>` command.
   - For IEv8.0, run the `mongodump --host <ip>:<port> -u <username> -p <password> --authenticationDatabase <dbname> --ssl --sslAllowInvalidCertificates --authenticationMechanism SCRAM-SHA-256 --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.
6. Appendix: 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.

Enter the following command in one line and run it to restore the dumped data onto the MongoDB Server:

- **For v7.x,** run the `mongorestore --host <ip>:<port> -u <username> -p <password> --authenticationDatabase <database_name> --gzip <filepath>` command.

- **For v8.0,** run the `mongorestore --host <ip>:<port> -u <username> -p <password> --authenticationDatabase <database_name> --authenticationMechanism SCRAM-SHA-256 --gzip <filepath>` command.

**Example:**

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

**Tip:** If SSL is enabled, run the following commands:

- **For v7.x,** run the `mongorestore --host <ip>:<port> -u <username> -p <password> --authenticationDatabase <dbname> --ssl --sslAllowInvalidCertificates --gzip <filepath>` command.

- **For v8.0,** run the `mongorestore --host <ip>:<port> -u <username> -p <password> --authenticationDatabase <dbname> --ssl --sslAllowInvalidCertificates --authenticationMechanism SCRAM-SHA-256 --gzip <filepath>` command.