NetBrain® Integrated Edition 10.1

System Upgrade Guide

Two-Server Deployment

Contents

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.
>
> **Note:** In IEv10.1, upgrading the v7.* two-server deployment will unify all the usernames and passwords, including MongoDB, Elasticsearch, RabbitMQ and Redis together with the Web API authentication key for communication between Web API Server and Knowledge Cloud Proxy/Service Monitor Agents to be same as the previous defined MongoDB username and password. If different credentials are needed for any of above services, please refer to the upgrade guide for Distributed deployment mode.
>
> **Note:** The Service Monitor Agent running on the Linux server(s) uses "netbrainadmin" user, and this user needs sudoers privilege to monitor other NetBrain components as well as to execute the system update tasks.
>
> **Note:** For Linux servers, make sure each path of **/usr/lib**, **/usr/share**, and **/etc** has more than **10GB** free space to install the component files.
>
> **Note:** There must be more than **180GB** free space for the Application Server PostgreSQL data path.
>
> **Note:** If the Web API Server is installed on a Win 2012 R2 server with certificate binding to enable HTTPS, and the certificate does not meet the requirement of TLS1.2, users need to create and bind a new TLSv1.2 compatible certificate on Web API Server to provide HTTPS. Refer to Appendix: Generating SSL Certificate.

Upgrade from IEv7.1x

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Network Connectivity Requirements

Source	Destination	Protocol *) and Port Number **)
Thin Client Service Monitor Agent	Application Server	HTTP/HTTPS (80/443)
Application Server	Database Server	TCP 5672/6379/9200/27017/27654/15672 ***)
Application Server	Ansible Agent (add-on)	TCP 9098
Application Server	Live Network	ICMP/SNMP/Telnet/SSH/REST API
Database Server	Application Server	TCP 9099 ***)

> **Note:** *) If SSL was enabled for any component including MongoDB/ElasticSearch/Redis/RabbitMQ/License Agent/Front Server Controller/Ansible Agent/Auto Update Server (within Web API Server), the SSL protocol should be added to firewall rules to enable SSL connection between servers.
>
> **Note:** **) The port numbers listed in this column are defaults only. The actual port numbers used during installation might be different.
>
> **Note:** ***) Ensure the newly added ports (9099 and 15672) are open for future system update for 10.1.

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 server where NetBrain applications are installed and stop the following services in the Task Manager.

> **Note:** If the system was upgraded from the versions older than 7.1, ensure the service named **proxyserverie** no longer exists in the **Services** tab of **Task Manager**; otherwise follow the steps [here](#) to uninstall the Proxy Server before proceeding with the upgrade procedures.

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
Update Server	NetBrainUpdateService
Redis	RedisMaster
RabbitMQ	RabbitMQ

2. Disable the **Cron** task on the Database 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 Database Server 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 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 **/opt/mongodb** directory to double-check the total size of MongoDB data to ensure the target folder (**/etc/mongodb_databk** in this example) has sufficient space.

6. Run the `cp -a data /etc/mongodb_databk` command under the **/opt/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.

> **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.

1.4. Upgrading NetBrain Database Server

Pre-Upgrade Tasks

▪ Ensure you have upgraded the Linux OS to **Red Hat Enterprise Linux Server 7.5/7.6/7.7/7.8/7.9, 64-bit, CentOS 7.5/7.6/7.7/7.8/7.9, 64-bit** or **Oracle Linux Server 7.7/7.8/7.9, 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.

> **Note:** Upgrading the Linux operating system from v7.x to v8.x is **NOT** supported once the installation or upgrade of NetBrain Workstation v10 is completed. Refer to [Linux System Upgrade Instructions Online](#) or [Linux System Upgrade](#)

> Instructions Offline for workaround solution to upgrade Linux operating system from v7.x to v8.x prior to the installation of or upgrade to NetBrain Workstation v10.

- 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.

- RabbitMQ has dependencies on the third-party package openssl (1.0.2k and above) and selinux-policy-target (3.13.1 and above). Before you install the RabbitMQ, run the `rpm -qa|grep openssl` and `rpm -qa|grep selinux-policy-targeted` commands to check their version info. If the version number is less than the required one, you can run the `yum -y upgrade openssl` and `yum -y upgrade selinux-policy-targeted` commands to upgrade them online.

- 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.

- Service Monitor Agent has dependencies on the third-party package **libffi-devel zlib-devel readline-devel bzip2-devel ncurses-devel gdbm-devel xz-devel tk-devel libffi-devel gcc**. Run the `rpm -qa|grep -E "zlib-devel|readline-devel|bzip2-devel|ncurses-devel|gdbm-devel|xz-devel|tk-devel|libffi-devel|gcc"` command to check whether it has been installed on this Linux server. If it has not been installed yet, 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 gcc` command to install them online
  - **Offline Install:** refer to Appendix: Offline Installing Third-party Dependencies for further instructions.

Upgrading NetBrain Database Server

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, **netbraintemp10.1**.

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

3. Download the installation package.
   - **Option 1:** If the Linux server has no access to the Internet, upload the **netbrain-all-in-two-linux-x86_64-rhel-10.1.tar.gz** file to the **/opt/netbraintemp10.1** directory by using a file transfer tool.
   - **Option 2:** If the Linux server has access to the Internet and the **yum** service has been installed:

1) Run the `yum -y install wget` command to install the `wget` command if it has not been installed.

2) Run the `cd /opt/netbraintemp10.1` command to navigate to the **/opt/netbraintemp10.1** directory.

3) Run the `wget <download link>` command under the **/opt/netbraintemp10.1** directory to download the **netbrain-all-in-two-linux-x86_64-rhel-10.1.tar.gz** file to this directory:

> **Note:** Contact [NetBrain Support Team](#) to get the download link. The download link is case-sensitive.

4. Run the `tar -zxvf netbrain-all-in-two-linux-x86_64-rhel-10.1.tar.gz` command under the **/opt/netbraintemp10.1** directory to extract installation files.

```
[root@localhost netbraintemp10.1]# tar -zxvf netbrain-all-in-two-linux-x86_64-rhel-10.1.tar.gz
netbrain-all-in-two-linux-10.1/
...
netbrain-all-in-two-linux-10.1/upgrade.sh
```

5. Run the `cd netbrain-all-in-two-linux-10.1` command to navigate to the **netbrain-all-in-two-linux-10.1** directory.

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

7. Run the `./upgrade.sh` command under the **netbrain-all-in-two-linux-10.1** directory to install NetBrain Linux components.

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 each Linux component.

```
[root@localhost netbrain-all-in-two-linux-10.1]# ./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: 2021-02-28 00-00-18.804: Old version of MongoDB was installed. Upgrade is required.
INFO: 2021-02-28 00-00-18.990: Creating upgrading log...
```

```
INFO: 2021-02-28 00-00-19.002: Starting to check system
INFO: 2021-02-28 00-00-20.269: Collecting system information SUCCEEDED.
INFO: 2021-02-28 00-00-20.278: ALL_COMPONENT_LIST=servicemonitoragent mongodb licenseagent
elasticsearch rabbitmq redis
...
```

> **Note:** If the Service Monitor was not installed previously, you will be prompted to enter the relevant info to install Service Monitor.

3) Configure the following [parameters](#) one by one with an interactive command line.

```
Install NetBrain Linux components.
The values in brackets are the default values of the parameters. To keep the default value
for the
current parameter, press the Enter key.
Please enter the data path for NetBrain components (rabbitmq redis)[/var/lib/netbrain]:
Please enter a log path for NetBrain [/var/log/netbrain]:
Please enter the IP address of this machine [10.10.3.142]:
Please enter the NetBrain Service Username: admin
Please enter the NetBrain Service Password:
INFO: conf=/opt/mongodb/mongod.conf
INFO: MongoDB configuration file exists.
INFO: The service of mongod is running.
INFO: Successfully connected to MongoDB.
Use SSL on NetBrain Database Server: no
Use customized server ports for rabbitmq, redis? [no]
```

> **Notes:**
>
> ▪ Make sure the designated data path has more than **100GB** free space, and the designated log path has more than **50GB** free space. You can run the `df -h` command to check which directory has been mounted to a large disk.
>
> ▪ The certificate name specified in the path must strictly match the one you uploaded.
>
> ▪ Here please input the MongoDB username and password as the NetBrain service username and password, and they will be used to change/initialize the credentials for Elasticsearch, RabbitMQ and Redis together with the API Key for Service Monitor Agent during upgrading. They will be used for validating the connections with:
> - MongoDB, Elasticsearch, RabbitMQ, and Redis when upgrading NetBrain Application Server
> - Front Server Controller when setting up the system
> - Service Monitor Agent when communicating with Web API Server

4) To continue the installation with the current configurations, press the **Enter** key. To change any configurations, type **no**.

```
Data path:                    /var/lib/netbrain
Log path:                     /var/log/netbrain
IP address:                   10.10.3.142
Username:                     admin
Password:                     ******
Uses SSL:                     no
```

```
Redis port:                        6379
Rabbitmq port:                     5672


Do you want to continue using these parameters? [yes]
```

8. RabbitMQ and Redis will be installed, and MongoDB, License Agent, Elasticsearch and Service Monitor Agent will be upgraded. Then run the `reboot` command to restart the machine.

9. Run the following commands to check their service status separately after the server starts up.

- **systemctl status mongod**

```
[root@localhost ~]# systemctl status mongod
  mongod.service - MongoDB service
  Loaded: loaded (/usr/lib/systemd/system/mongod.service; enabled; vendor preset: disabled)
  Active: activing (running) since Tue 2020-07-07 13:23:24 EDT; 5min ago
  Control: 1143 (mongod)
  Memory: 902.3M (limit: 8.0G)
...
```

- **systemctl status netbrainlicense**

```
[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 2020-07-07 13:23:35 EDT; 9min ago
  Process: 1175 ExecStart=/usr/bin/netbrainlicense/licensed -f
/etc/netbrainlicense/licensed.conf (code=exited, status=0/SUCCESS)
  Process: 1150 ExecStartPre=/bin/chmod o+r /sys/class/dmi/id/product_uuid (code=exited,
status=0/SUCCESS)
 Main PID: 2111 (licensed)
   Memory: 17.6M
...
```

- **systemctl status elasticsearch**

```
[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 2020-07-07 13:23:25 EDT; 12min ago
  Docs: http://www.elastic.co
  Main PID: 1153 (java)
  Memory: 4.5G
...
```

- **systemctl status rabbitmq-server**

```
[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 2020-07-07 13:26:56 EDT; 9min ago
  Main PID: 1136 (beam.smp)
  Status: "Initialized"
```

```
   Memory: 131.2M
...
```

- **systemctl status redis**

```
[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 2020-07-07 13:23:25 EDT; 14min ago
 Main PID: 1159 (redis-server)
   Memory: 7.3M
...
```

- **systemctl status netbrainagent**

```
[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 2020-07-07 13:23:24 EDT; 15min ago
  Main PID: 1144 (python3)
  Memory: 135.0M
...
```

10. Verify the upgraded MongoDB version. The version should be v4.0.28.

   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 v4.0.28
...
```

> **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.

Parameters

Refer to the following table for the parameters of NetBrain Database Server.

Parameter	Default Value	Description
Data path	/var/lib/netbrain	The directory to save data of all NetBrain Linux components. You can press the **Enter** key to keep the default path or type a new one.

Parameter	Default Value	Description
Log path	`/var/log/netbrain`	The directory to save logs of all NetBrain Linux components. You can press the **Enter** key to keep the default path or type a new one.
IP address of this machine	`<current IP address automatically obtained from the machine>`	The binding IP address for MongoDB/ElasticSearch/NetBrain License Agent. It will be used for establishing connections with NetBrain Application Server. You can press the **Enter** key to keep the default value or type a new one.
NetBrain Service username		The existing admin username and password of your MongoDB in the previous version.
NetBrain Service password		
Certificate file path		The file name of the certificate file that contains the public key. **Note:** It is required only if **Use SSL on NetBrain Services** is enabled.
Private Key file path		The file name of the private key file. **Note:** It is required only if **Use SSL on NetBrain Services** is enabled.
Certificate Authority file path		The name and directory of the chain certificate authority (CA) file, which is used to authenticate the CA issuing the SSL certificates. **Note:** It is required only if **Use SSL on NetBrain Services** is enabled.
Use customized server ports?	`no`	Whether to use customized port number for each Linux component. To customize ports, type **yes.**
Rabbitmq port	`5672`	The port number that the RabbitMQ service listens to. **Note:** Make sure the port is not used by other applications. **Note:** Keep notes of the customized port because it will be used for validating the connections with RabbitMQ when installing NetBrain Application Server.
Redis port	`6379`	The port number that the Redis service listens to. **Note:** Make sure the port is not used by other applications. **Note:** Keep notes of the customized port because it will be used for validating the connections with Redis when installing NetBrain Application Server.

1.5. Upgrading NetBrain Application Server

Pre-Upgrade Tasks

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

- Complete the following steps to back up the configuration files for your Front Server and Front Server Controller before upgrading the Application Server.

  1) Navigate to the **C:\Program Files\NetBrain\Front Server\conf** directory, and then back up all files WITHOUT the prefix "**fix_**".

  2) Navigate to the **C:\Program Files\NetBrain\Front Server Controller\conf** directory, and then back up all files WITHOUT the prefix "**fix_**".

  > **Note: C:\Program Files\NetBrain** is the default installation directory of the Application Server. If you changed it during the Application Server installation, modify it accordingly.

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

Upgrading NetBrain Application Server

Complete the following steps with administrative privileges.

1. Download the **netbrain-all-in-two-windows-x86_64-10.1.zip** file and save it in your local folder.

   > **Note:** Contact [NetBrain Support Team](#) to get the download link. The download link is case-sensitive.

2. Extract files from the **netbrain-all-in-two-windows-x86_64-10.1.zip** file.

3. Navigate to the **netbrain-all-in-two-windows-x86_64-10.1** folder, right-click the **netbrain-application-10.1.exe** file and then select **Run as administrator** to launch the Installation Wizard.

4. Follow the installation wizard to complete the installation 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**.

      > **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.
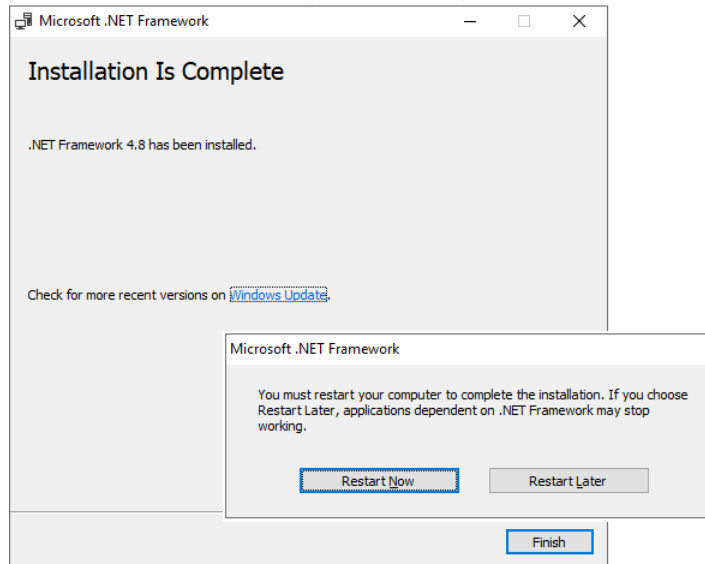
2) Stop all the NetBrain services on the Windows server manually before continuing the upgrade.

3) Click **Yes** in the dialog box to initiate the system upgrade.
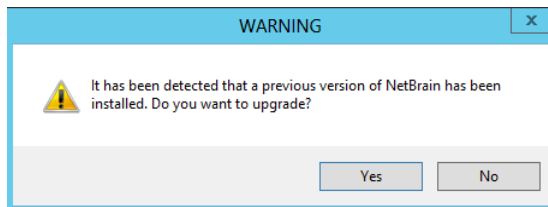
4) On the Welcome page, click **Next**.

5) On the NetBrain Integrated Edition Prerequisites page, read the list of Linux components that must be deployed beforehand in your environment and click **Next**.
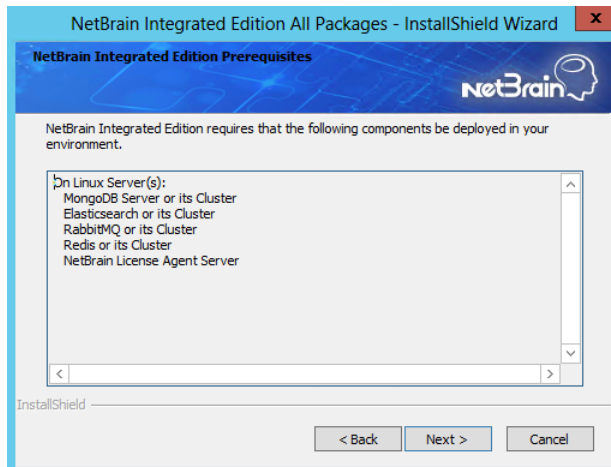
6) On the System Configuration page, review the system configuration summary and click **Next**.

7) On the License Agreement page, read the license agreement, and then select the **I have read the subscription EULA** check box and click **I ACCEPT**.
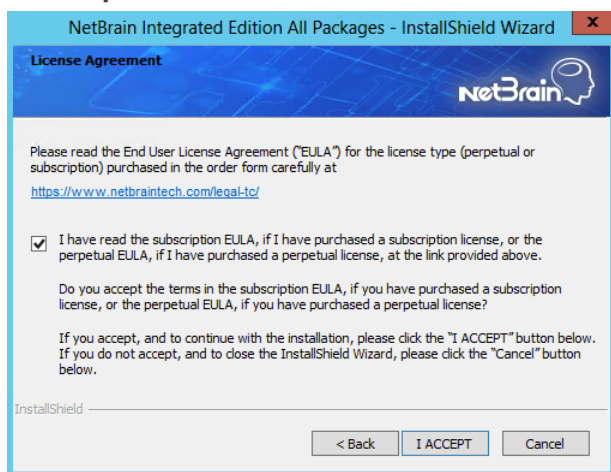
8) On the Customer Information page, input your username and company name. Click **Next**.
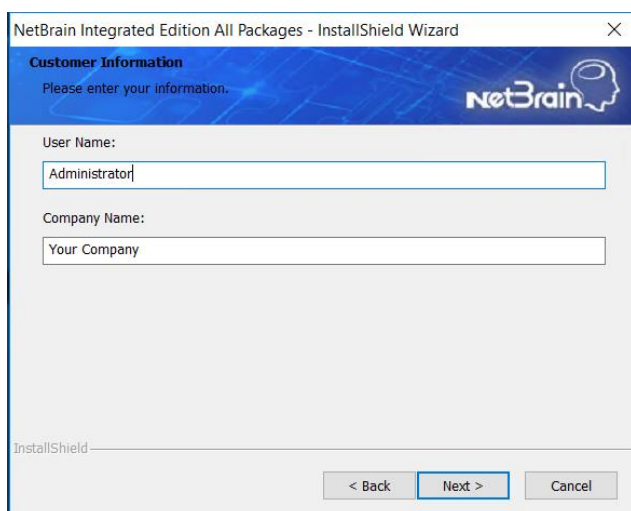
9) On the System Connectivity Configuration page, review the connection information to connect to NetBrain Database Server. Click **Next**.

> **Note:** Checking the **Use SSL** option will inherit the SSL settings of your existing NetBrain Database Server.
>
> **Note:** If you customized a port number for any of Linux components during the installation of NetBrain Database Server, select the **Use Customized Ports** check box.

10) (Required only if the **Use Customized Ports** check box is selected) On the Customized Settings page, enter the ports of RabbitMQ and Redis, and leave other fields unchanged. Click **Next**.

> **Note:** Disk space check will be performed to ensure the requirement of minimum 50G free disk space is met.

11) On the Auto Update Server page, enter the required information and click **Next**.

12) On the Enable Platform Resources Auto Update page, if you want these resources to be downloaded automatically, check the Download and Install Platform Resources Automatically box. Click **Next**.

13) (Required only if the **Use SSL** check box is selected) Configure the following SSL settings.

    a) On the Certificate Authority Configuration page, to validate the Certificate Authority (CA) of the SSL certificates used on NetBrain Database Server, select the **Conduct Certificate Authority verification**

check box and click **Browse** to upload the chain certificate file. Click **Next**.
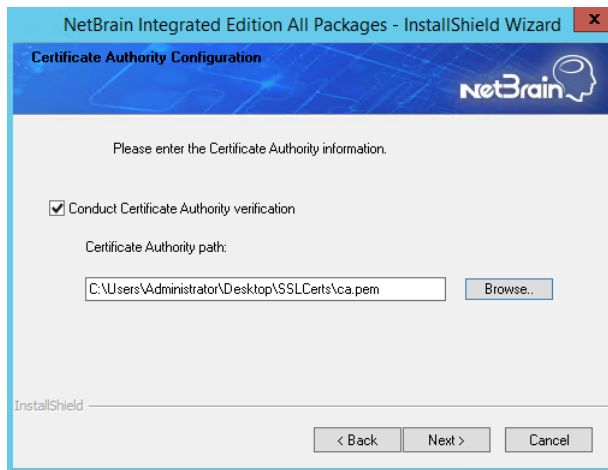
b) On the Certificate Configuration page, click **Browse** to upload the certificate file and private key file to enable SSL communications on Front Server Controller. Click **Next**.
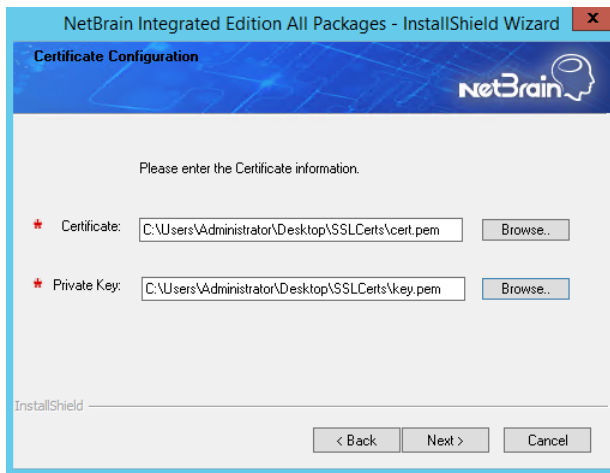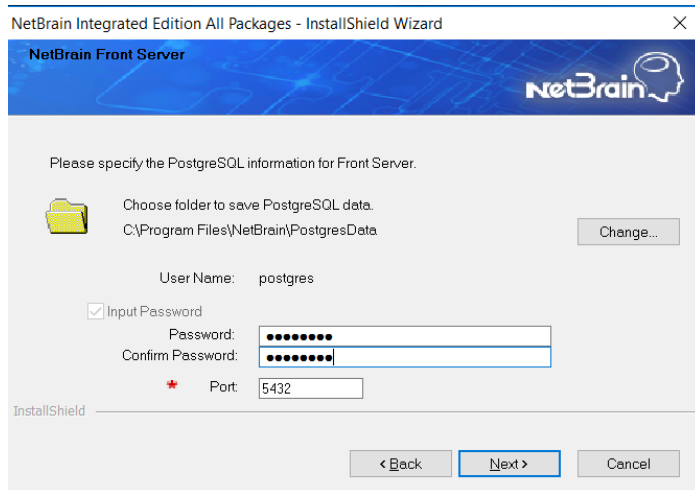
14) On the KeyVault Administration Passphrase Settings page, create a passphrase to initialize and manage the system KeyVault which contains all encryption keys to protect data security. Type it twice and click **Next**.
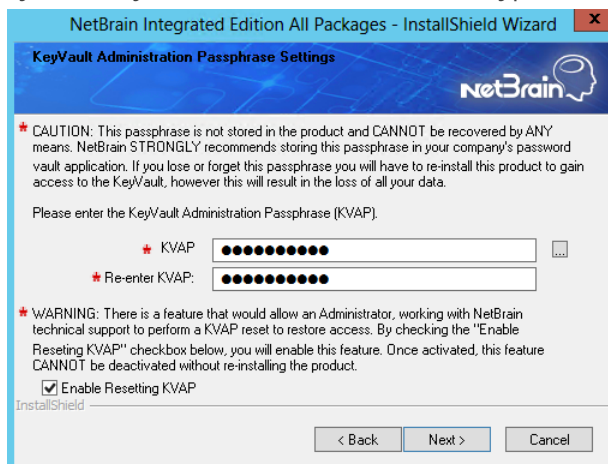
> **Tip:** The passphrase must contain at least one uppercase letter, one lowercase letter, one number, and one special character, and the minimum permissible length is 8 characters. All special characters except for the quotation mark (") are allowed.
>
> **Note:** Keep notes of the passphrase because it is required when you scale up or upgrade the Application Server. In case of losing the passphrase, select the **Enable Resetting KVAP** check box so that NetBrain system admin can reset the passphrase at any time.
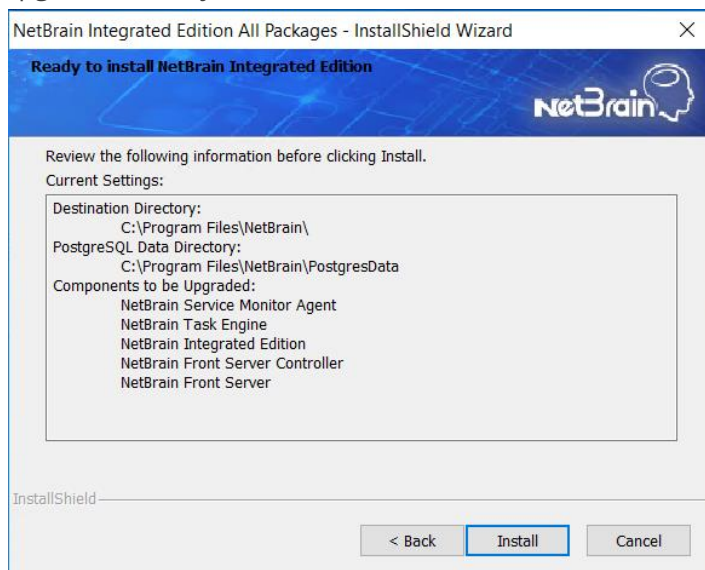
15) On the NetBrain Front Server page, create and confirm the password for PostgreSQL Database.

> **Note:** The length of the password must be greater than 8 characters.
> **Note:** Make sure the designated data folder has more than 180GB free space.

16) Review the server components to be upgraded and click **Install**. All the Windows components will be upgraded one by one.

Note: Depending on the hard drive type of the Application Server, the entire upgrade process may take approximately 1hour (SSD) to 2.5 hours (HDD). Please expect the lengthy upgrade process and refrain from interrupting it.

17) (Optional) Ensure the NetBrain installation process using administrator account has the necessary permissions to modify "User Rights Assignment" in "Local Security Policy" or change the local user privileges. Otherwise, the following error message will prompt when installing each Windows component.
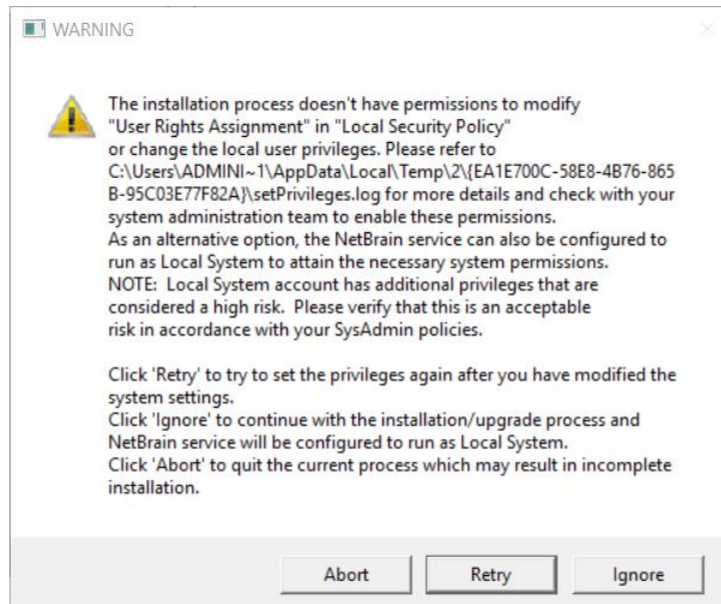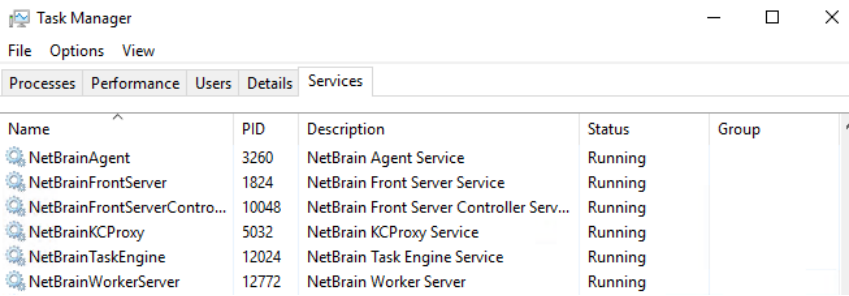

- o Click **Ignore** to continue with installation/upgrade process and NetBrain service will be configured to run as Local System.

- o If you have security concerns, click **Abort** to quit the installation/upgrade process.

- o Click **Retry** after you have modified the system settings.

  Note: Local System accounts have additional privileges that are considered a high risk. Please verify that this is an acceptable risk in accordance with your SysAdmin policies.

  Note: After clicking **Abort**, please check with your system administration team to enable the relevant permissions, uninstall the affected component(s) and reinstall. Contact NetBrain support team if you need any assistance during the process.

5. After all components are successfully upgraded, click **Finish** to complete the upgrading process and exit the Installation Wizard.

6. Open the Task Manager and navigate to the **Services** tab, you can find the following running NetBrain services.

Post-Upgrade Tasks

▪ Follow the steps below to recover the special settings if you have customized the **Web.config** file for your Web Server and/or Web API Server:

1) Navigate to **NetBrain > Web Server** and locate the backup file **backup_Web.config** under **nb_publish_server** and **nb_publish_client.**

2) Manually recover the settings one by one in **Web.config** according to the previous configurations in the backup file **backup_Web.config.**

> **Note: DO NOT** directly replace the **Web.config** file with the backup file as it may cause log-in problems for NetBrain Workstation.
>
> **Note:** Contact NetBrain Support if you have any questions regarding the specific items in the **Web.config** file that need to be recovered.

▪ Uninstall the **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 step above.

▪ If you have updated the CA file during the system upgrade and enabled the SSL with CA verification for the Front Server Controller, you must upload the new CA file to the Front Server Controller by navigating to **System Management > Edit Font Server Controller.**

1.6. Unbinding Perpetual License

1. In your web browser, navigate to **http(s)://<IP address of NetBrain Application 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 Application 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.

1.7. 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 Application 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 Application 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.

4. Check the tenant and domain nodes. If there is more than one domain, you need to allocate the domain.

1.8. 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.
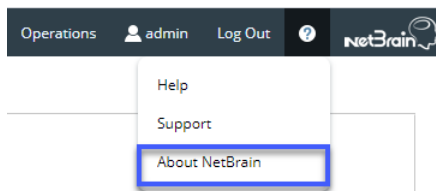
   2) Check the version information. The product version should be 10.1.

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. The version should be v4.0.28.

> **Note**: The `<database_name>` mentioned in the above command must be **admin** for NetBrain.

Example:

```
[root@localhost ~]# mongo --host 10.10.3.142:27017 -u mongodb -p mongodb --
authenticationDatabase admin --authenticationMechanism SCRAM-SHA-256
MongoDB shell version v4.0.28
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.
>
> **Note**: The `<database_name>` mentioned in the above command must be **admin** for NetBrain.

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 if the system version number is 10.1.1.

```
rsnetbrain:PRIMARY> db.SystemInfo.find({_id: "SystemVersion"})
{ "_id" : "SystemVersion", "version" : "10.1.1", "operateInfo" : { "opUser" : "NetBrain",
"opTime" :
  ISODate("2020-07-14T18:31:21.735") } }
```

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

> **Note:** System Update feature heavily relies on all the NetBrain servers and service metrics, therefore it is required to ensure all the NetBrain servers and component metrics can be viewed in the Service Monitor page.

1.9. Configuring Auto Upgrade Settings

Knowledge Cloud (KC) manages both the framework components and the platform resources and allows NetBrain Workstation to automatically upgrade a patch or minor release. Besides replacing the files, the auto-upgrade process may restart services, execute the database upgrading, check the system health and roll back the release if the update fails.

Platform resources can be downloaded and installed automatically since NetBrain Workstation will be connected to KC through License Server. And for Framework resources, the software update package must be downloaded from NetBrain Customer Portal, manually uploaded into the system and then system updates need to be scheduled accordingly.

NetBrain Workstation Auto Upgrade flow consists of the following steps:

> **Note:** Only user with System Management permissions can perform the following actions.

1. [Check the Latest Version](#)

2. [Download Package from NetBrain Customer Portal](#)

3. [Upload Package to NetBrain Workstation](#)

4. [Schedule Update](#)

5. [View Update Status](#)

6. [View Update History](#)

Check the Latest Version

Follow the steps below to check the available releases from NetBrain:

> **Note:** The following steps only apply to the online auto upgrade procedures.

1. In the System Management page, click the ☰ start menu> **System Update**.

2. By default, the **Automatically check the latest version** check box is enabled. You can click **Check Update Now** to see if there is a new version available.

   > **Note:** After the check box **Automatically check the latest version** is enabled, users with 'sys admin' role will receive auto notification via email when a new version becomes available.
   >
   > **Note:** The Web API Server is required to have internet access with NetBrain public License Server in order to perform the function of **Automatically check the latest version** and **Check Update Now**.
   >
   > **Note:** In order to download and install platform resources automatically, you need to enable the **Automatically check the latest version** check box, as well as the **Download and Install Platform Resources Automatically** check box.
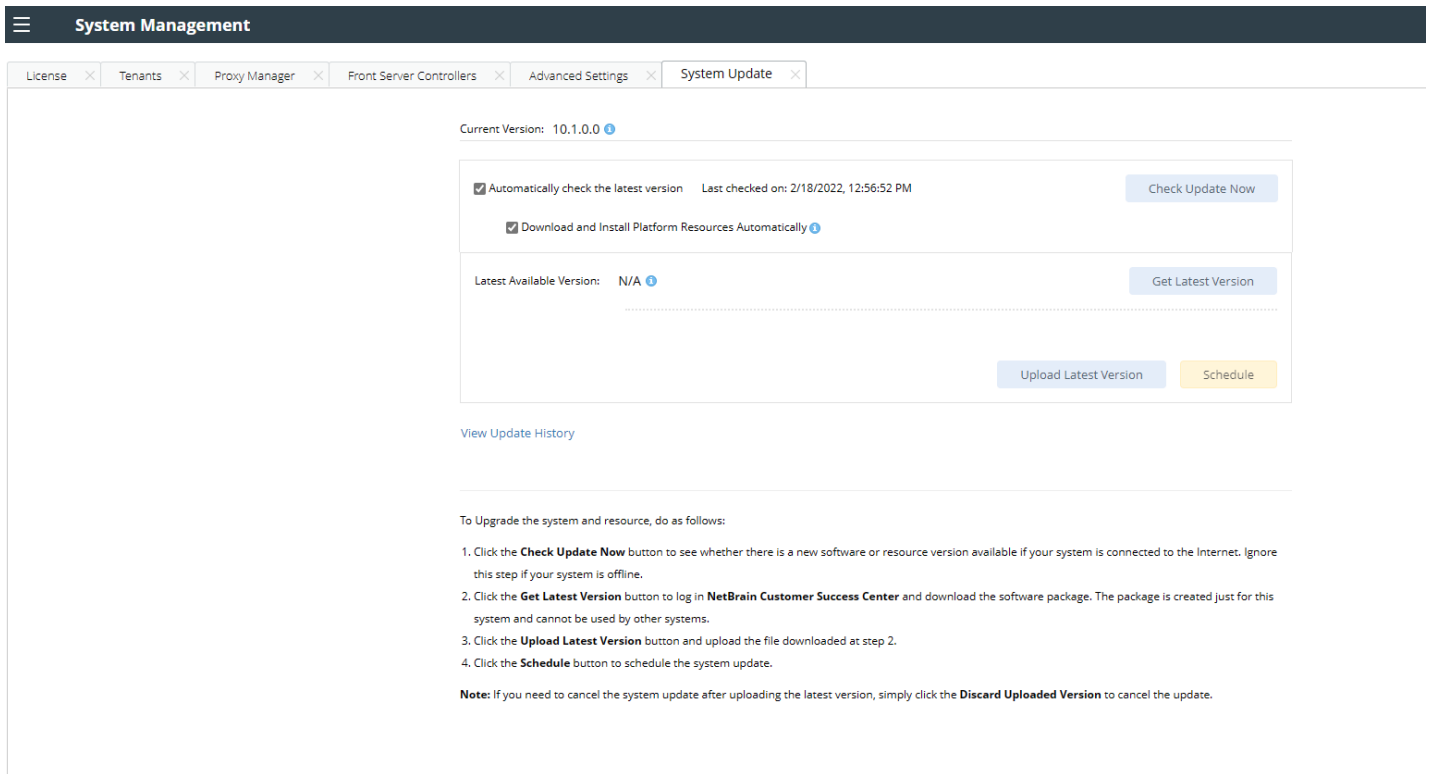
3. When this check is enabled, NetBrain Workstation will check whether a minor release, a patch, a customized built-in, a customized resource or common platform resource updates have been published since the last time check (either auto or manual check). The latest available version will be displayed with the release note.

4. If the respective release or patch is available, after reviewing the Release Note, click **Get Latest Version** to [Download Package from NetBrain Customer Portal](#).

Download Package from NetBrain Customer Portal

Follow the steps below to download the system upgrade package from NetBrain Customer Portal:

1. Log into the NetBrain Customer Portal with your username and password.

> **Note:** After clicking **Get Latest Version** in NetBrain Workstation, you will be redirected to the NetBrain Customer Portal. The portal account credentials are required by the web browser to grant access to the NetBrain Customer Portal.

2. Confirm the required info and click **Generate Package**.

> **Tip:** Required info includes the License ID, Framework Version, Common Repo Version, Customized Built-in Resource Repo, Customized Resource Repo.

> **Tip:** If you don't want to download framework components, enable the **Exclude Framework Patch** check box.

3. Click **Resource Package Link** to download the package to your local drive.

4. Keep note of the password for next step- Upload Package to NetBrain Workstation.

Upload Package to NetBrain Workstation

Follow the steps below to upload the system upgrade package to NetBrain Workstation:

1. In the System Management page, the ☰ start menu> **System Update**.

2. Click **Upload Latest Version**.

3. Click **Browse** and select the system upgrade package (.zip file).

4. Enter the password and click **Upload**.
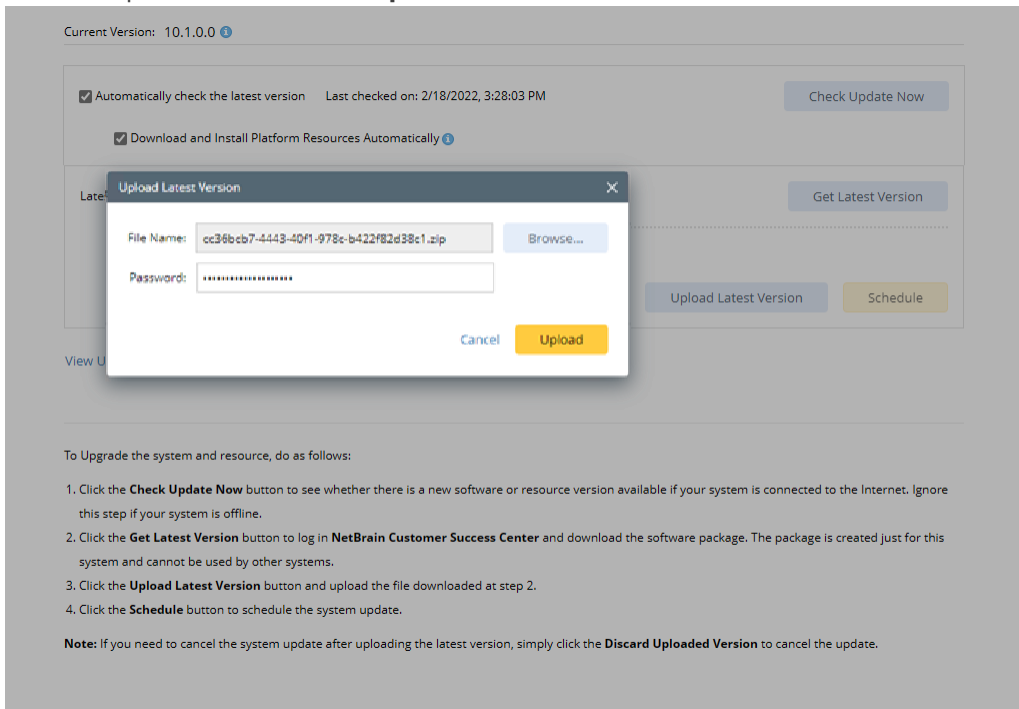
> **Tip:** With the **Discard Uploaded Version** button, you can discard the previous uploaded update package before it is scheduled and delete the system update task before the scheduled task is executed.

Schedule Update

Follow the steps below to schedule the system update:

1. Run [the system update pre-check tool](#) to verify the environment readiness for the auto-update.

2. In the System Management page, click the ☰ start menu> **System Update**.

3. Click **Schedule**.

4. Review the license agreement, select the **I have read the subscription EULA** check box and click **I ACCEPT**.

License Agreement ✕

Please read the End User License Agreement ("EULA") for the license type (perpetual or subscription) purchased in the order form carefully at

https://www.netbraintech.com/legal-tc/

☐ 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.

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 click the **"I ACCEPT"** button below. If you do not accept, and to close the Wizard, please click the **"Cancel"** button below.

Cancel   I ACCEPT

5. **(Optional)** Check the **Enable Test Plan** checkbox.

> **Tip:** You can leave the **Enable Test Plan** checkbox unchecked to skip the test plan.
>
> **Note:** Only user with domain and tenant access will be granted permission to run the test plan.

1) Click **Select** and specify the desired Tenant/Domain to perform Domain Health Check.

> **Note**: If there are more than one tenant or domain, step 1) must be completed before proceeding to step 2).
>
> **Note**: If there is only one tenant and domain, the Initial Tenant will be automatically selected and you can directly proceed to step 2).

2) Click **Auto Test Group** to specify the devices for Data Accuracy Test.
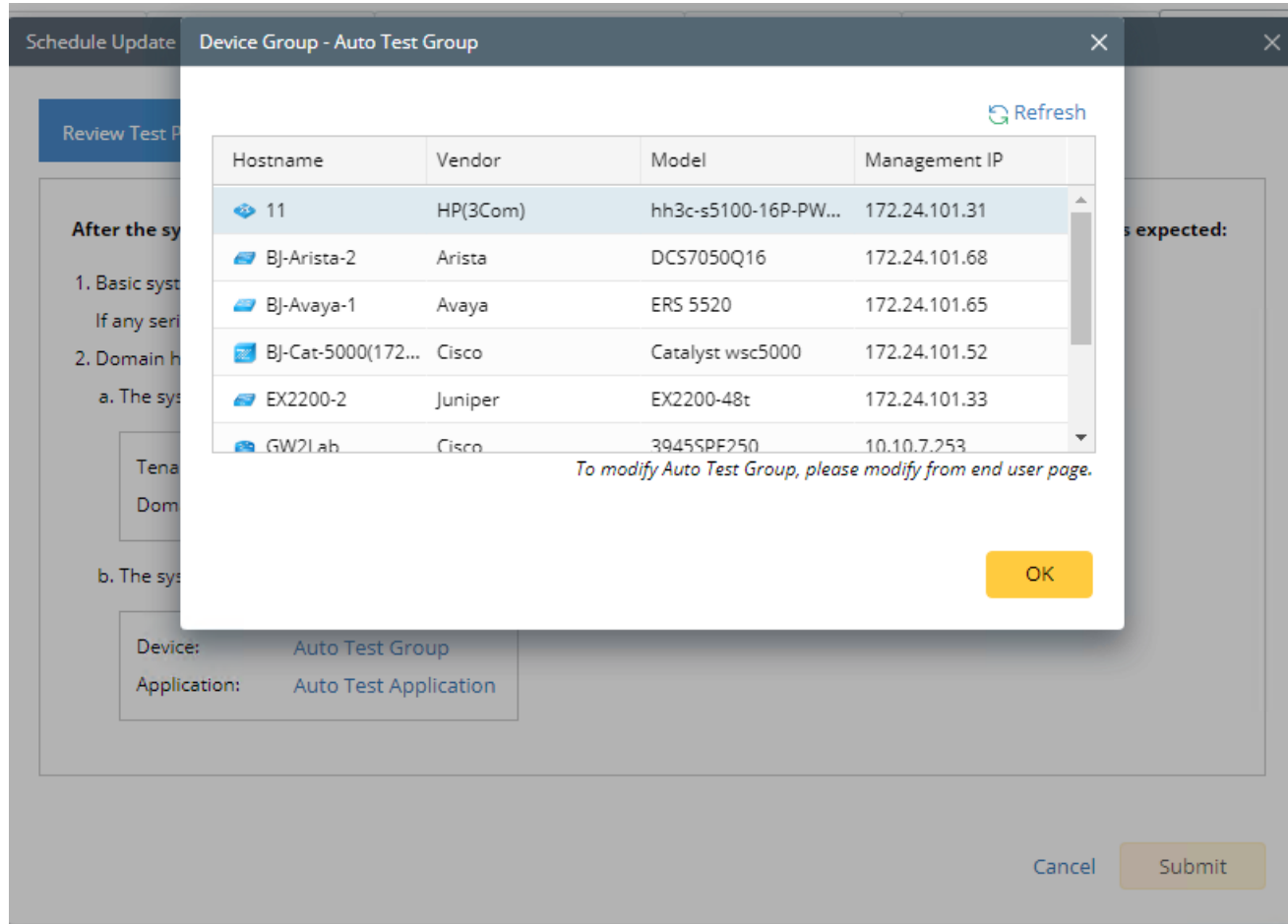
Tip: The devices in the Auto Test Group are automatically selected according to the device type discovered by the system. You can also manually edit or delete any devices to suit your specific needs.

3) Click **Auto Test Application Folder** to specify the application for Data Accuracy Test.
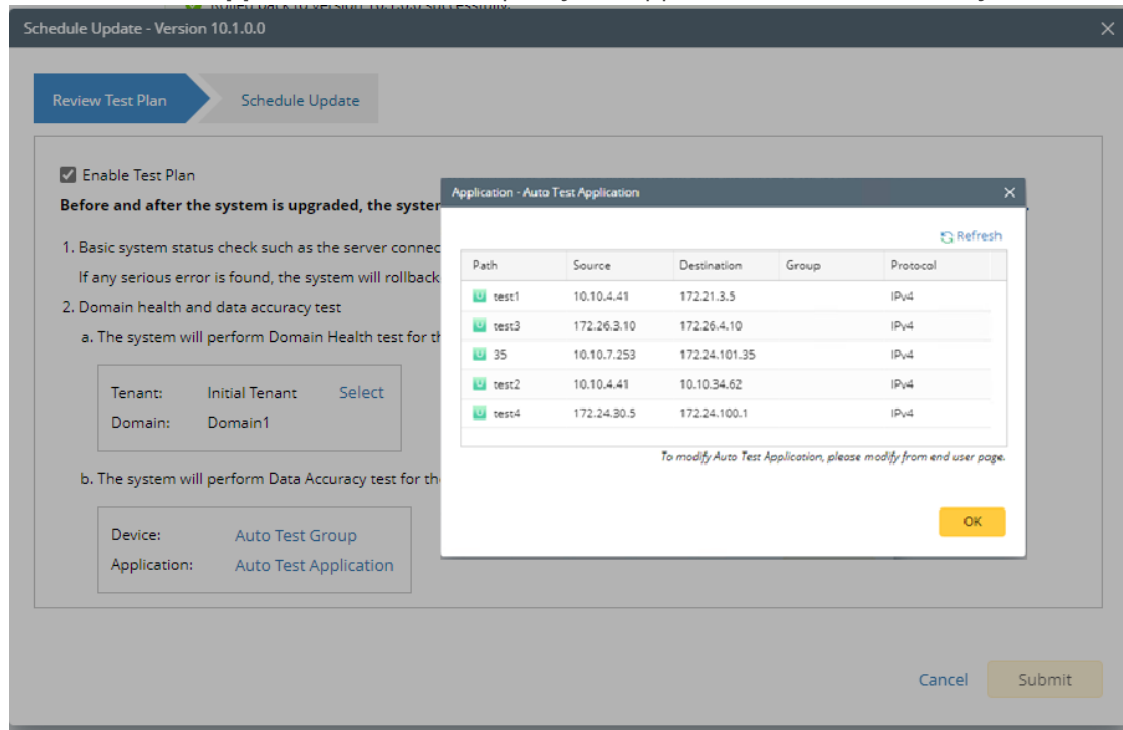
Note: The last used Application Paths (up to 5 paths) will be automatically copied to the Auto Test Application Folder. You can also manually change the auto selected path in [Application Manager](#).

6. Set up the schedule to start the system update.

> **Tip:** You can edit or remove the system update once it is scheduled.

7. Click **Submit** to apply the above settings.

> **Note**: A confirmation message will prompt if the selected tenant/domain does not have application path, you can click Yes to dismiss the message and continue with the update process.

View Update Status

The possible status of auto update are as follows:

Stage of the Auto Update	Possible Status
Before the execution of Auto Update	• Ready for schedule. • Ready for running.
During the execution of Auto Update	• Running.

After the execution of Auto Update	• The system is successfully updated to the new version.
	• The system is successfully updated to the latest version, but the user performs a manual rollback and the rollback succeeds.
	• The system is successfully updated to the latest version, but the user performs a manual rollback and the rollback fails.
	• The update fails, and the system is rolled back to the old version.
	• The update fails at the beginning (due to insufficient disk space to perform auto-upgrade, unavailable component and etc.) and the roll back is not executed.

View Update History

Follow the steps below to view the update history:

1. In the System Management page, click the ☰ start menu> **System Update**.

2. Click **View Update History**.

The update history only records the releases the system is scheduled to update with. The update history table provides the following information:

- **Update From:** the release number from which the system is updated.

- **Update To:** the release number to which the system is updated.

- **Update Time:** when the system finished the update.

- **Executor:** the person to schedule the update

- **Action:** upgrade or user roll back.

- **Status:** one of the statuses in View Update Status.

- **Release Note:** the link of the release note.

- **Installation Log:** the link of the installation log.

- **Test Report:** the link of the test results.

Upgrade From	Upgrade To	Updated Time	Executor	Action	Status	Release Note	Installation Log	Test Report
10.1.0.0 ⓘ	10.1.0.0 ⓘ	Mar 16, 2022, 11:32:11 PM	admin	Upgrade	Succeeded	Release Note	Installation Log	Test Results

OK

1.10. Customizing MongoDB Disk Alert Rules

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

1. In the System Management page, click the ☰ start menu > **Service Monitor**.

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.

1.11. Tuning Live Access

To tune live access, complete the following steps:

1. In your web browser, navigate to **http(s)://<IP address of NetBrain Application Server>/** to log in to your domain.

2. Click the ▤ start menu> **Tune Live Access**. The Tune Live Access tab opens with all devices in the domain listed.

3. Click **Start Tuning**.

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

1.12. Scheduling Benchmark Task

1. In the Domain Management page, click the ▤ start menu> **> Schedule Task**.

2. On the **Schedule Task > Schedule Discovery/Benchmark** tab, select the **Enable** check box for the **Basic System Benchmark** entry.

> **Note**: A full benchmark must be performed by enabling the **L2 Topology** option under the **Build Topology** section of the **Additional Operation After Benchmark** tab.

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: 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.tar.gz

   - **CentOS7.6:** http://download.netbraintech.com/dependencies-centos7.6.tar.gz

   - **CentOS7.7:** http://download.netbraintech.com/dependencies-centos7.7.tar.gz

   - **CentOS7.8:** http://download.netbraintech.com/dependencies-centos7.8.tar.gz

   - **CentOS7.9:** http://download.netbraintech.com/dependencies-centos7.9.tar.gz

   - **CentOS8.2:** http://download.netbraintech.com/dependencies-centos8.2.tar.gz

   - **CentOS8.3:** http://download.netbraintech.com/dependencies-centos8.3.tar.gz

   - **CentOS8.4:** http://download.netbraintech.com/dependencies-centos8.4.tar.gz

   - **CentOS8.5:** http://download.netbraintech.com/dependencies-centos8.5.tar.gz

   - **RHEL7.5:** http://download.netbraintech.com/dependencies-rhel7.5.tar.gz

   - **RHEL7.6:** http://download.netbraintech.com/dependencies-rhel7.6.tar.gz

   - **RHEL7.7:** http://download.netbraintech.com/dependencies-rhel7.7.tar.gz

   - **RHEL7.8:** http://download.netbraintech.com/dependencies-rhel7.8.tar.gz

   - **RHEL7.9:** http://download.netbraintech.com/dependencies-rhel7.9.tar.gz

   - **RHEL8.2:** http://download.netbraintech.com/dependencies-rhel8.2.tar.gz

   - **RHEL8.3:** http://download.netbraintech.com/dependencies-rhel8.3.tar.gz

   - **RHEL8.4:** http://download.netbraintech.com/dependencies-rhel8.4.tar.gz

   - **RHEL8.5:** http://download.netbraintech.com/dependencies-rhel8.5.tar.gz

   - **RHEL8.6:** http://download.netbraintech.com/dependencies-rhel8.6.tar.gz

   - **OL7.7:** http://download.netbraintech.com/dependencies-ol7.7.tar.gz

   - **OL7.8:** http://download.netbraintech.com/dependencies-ol7.8.tar.gz

   - **OL7.9:** http://download.netbraintech.com/dependencies-ol7.9.tar.gz

   - **OL8.2:** http://download.netbraintech.com/dependencies-ol8.2.tar.gz

   - **OL8.3:** http://download.netbraintech.com/dependencies-ol8.3.tar.gz

   - **OL8.4:** http://download.netbraintech.com/dependencies-ol8.4.tar.gz

   - **OL8.5:** http://download.netbraintech.com/dependencies-ol8.5.tar.gz

   - **OL8.6:** http://download.netbraintech.com/dependencies-ol8.6.tar.gz

   - **Alma8.4:** http://download.netbraintech.com/dependencies-almalinux8.4.tar.gz

- **Alma8.5:** http://download.netbraintech.com/dependencies-almalinux8.5.tar.gz

- **Alma8.6:** http://download.netbraintech.com/dependencies-almalinux8.6.tar.gz

- **Rocky8.4:** http://download.netbraintech.com/dependencies-rockylinux8.4.tar.gz

- **Rocky8.5:** http://download.netbraintech.com/dependencies-rockylinux8.5.tar.gz

- **Rocky8.6:** http://download.netbraintech.com/dependencies-rockylinux8.6.tar.gz

2. Copy the downloaded dependency package to your Linux server.

3. Run the `tar -zxvf dependencies-<OS version>.tar.gz` command to decompress the package.

> **Tip:** Possible values of **OS version** include: `centos7.5`; `centos7.6`; `centos7.7`; `centos7.8`; `centos7.9`; `centos8.2`; `centos8.3`; `centos8.4`; `centos8.5`; `rhel7.5`; `rhel7.6`; `rhel7.7`; `rhel7.8`; `rhel7.9`; `rhel8.2`; `rhel8.3`; `rhel8.4`; `rhel8.5`; `rhel8.5`; `rhel8.6`; `ol7.7`; `ol7.8`; `ol7.9`; `ol8.2`; `ol8.3`; `ol8.4`; `ol8.5`; `ol8.6`;`almalinux8.4`; `almalinux8.5`; `almalinux8.6`; `rockylinux8.4`; `rockylinux8.5`; `rockylinux8.6`.

4. Run the `cd dependencies` command to navigate to the decompressed directory.

5. Run the `offline-install.sh` command to install the dependencies.

3. 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.

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 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      netbrain     42 Oct 19 15:03 data
   drwxr-xr-x. 4 root      netbrain    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 /usr/lib/mongodb/data` command under the **/usr/lib/mongodb** directory to move the data directory to the **/usr/lib/mongodb** directory.

   5) Run the `chown -R netbrain:netbrain /usr/lib/mongodb/data/` command to change the ownership for the moved data folder.

   6) 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 netbrain netbrain   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
```

4. Run the `systemctl start mongod` 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.

> **Note**: The `<database_name>` mentioned in the above command must be **admin** for NetBrain.

Example:

```
[root@localhost upgrade_replica_set]# mongo --host 10.10.3.142:27017 -u mongodb -p mongodb --
authenticationDatabase admin
MongoDB shell version v3.6.4
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: v3.6.4
...
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.
>
> **Note:** The `<database_name>` mentioned in the above command must be **admin** for NetBrain.

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.

   > **Note**: The `<database_name>` mentioned in the above command must be **admin** for NetBrain.

   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 <database_name> --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 <filepath>` command.

> **Note**: The `<database_name>` mentioned in the above command must be **admin** for NetBrain.

<u>Example:</u>

```
[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 `mongorestore --host <ip>:<port> -u <username> -p <password> --authenticationDatabase <database_name> --ssl --sslAllowInvalidCertificates --gzip <filepath>` command.
>
> **Note**: The `<database_name>` mentioned in the above command must be **admin** for NetBrain.

6. Appendix: Generating SSL Certificate

1. Run PowerShell as an administrator.

2. Run the following command to create the certificate:
   ```
   New-SelfSignedCertificate –DnsName <Computer name> –CertStoreLocation
   "cert:\LocalMachine\My"
   ```

   > **Tip:** You can use the Tab key to help you input location, and hostname command for your computer name.
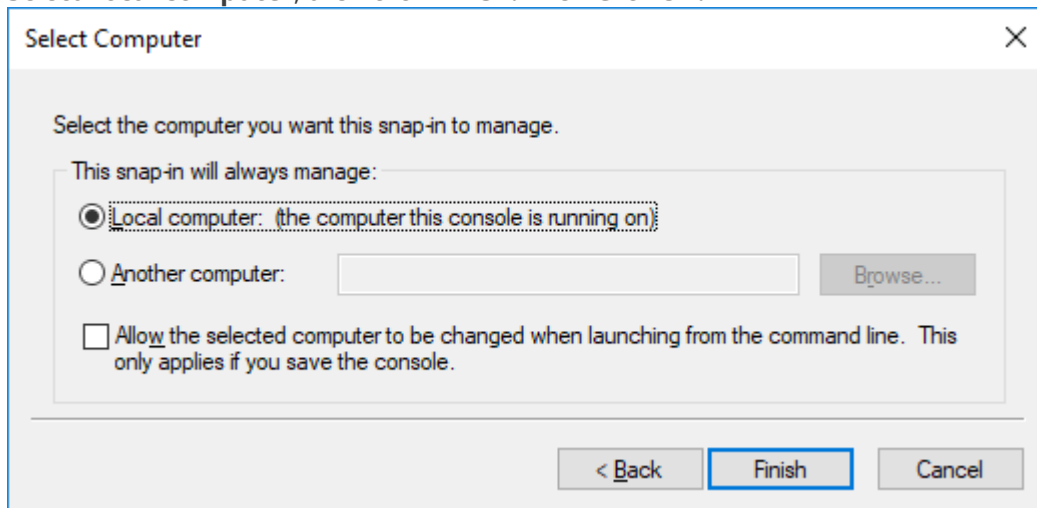
3. Next, you need to add the self-signed certificate as a trusted certificate authority.
   Run `MMC -32` as an administrator.

4. Select **File** > **Add or Remove Snap-ins.**
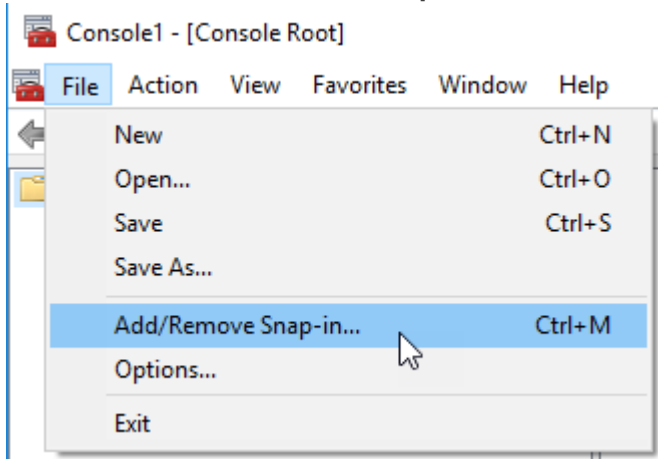
5. Select **Certificates** and then click **Add.**

6. Select **Computer account** and press **Next.**
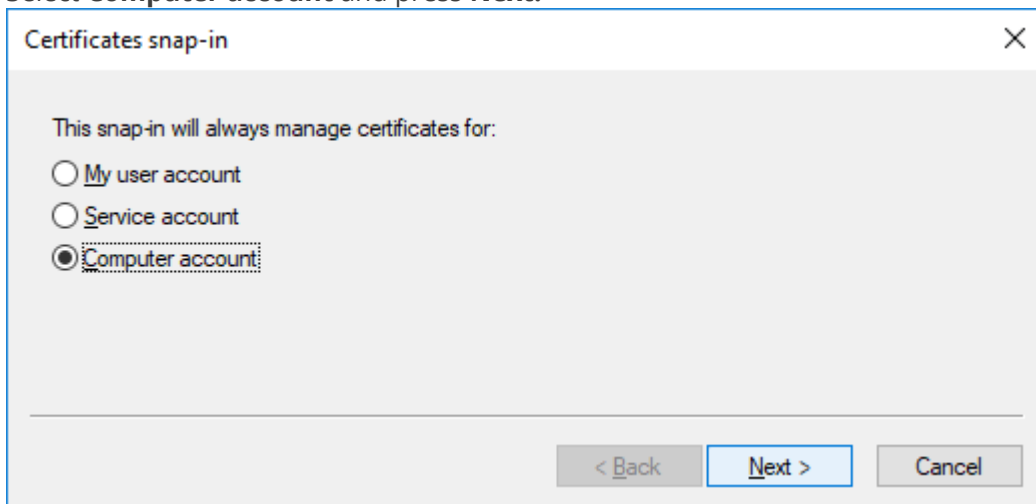
7. Select **Local computer**, then click **Finish.** Then Click **OK.**

8. Find the certificate in **Personal > Certificates.**

9. Right-click the newly created certificate and then select **Properties**. Input the desired *Friendly Name* field for the certificate based upon what you are testing. Once completed, select the **Apply** button followed by **OK**.

10. You can copy the certificate to **Trusted Root Certificate Authorities.**