



Running Nemo Without Root Privileges

Nemo Technical Note

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1 Introduction

By default, when Nemo is deployed, certain processes, such as the watchdog process, run with root privileges. However, processes spawned by the watchdog can be configured to run under a less-privileged user account, typically *nemo*.

Additionally, it is possible to run all Nemo processes, including the watchdog process, under a specific non-privileged user. This can be achieved by utilizing a user systemd instance.

Info

To run Nemo as a non-privileged user, version 5.1 or later is required. However, for probe deployments, running Nemo as a non-root user is not supported due to the low-level network interface requirements.

The purpose of this document is to outline the steps required to run Nemo as an unprivileged user. The content is organized into two chapters:

1. Initial Setup:

Steps to prepare the system for running Nemo as a non-root user. These steps need to be performed only once.

2. Upgrade Procedure:

Steps to follow whenever the application is upgraded.

Warning

Integration with external systems, such as SFTP-based reception of CDR files, is beyond the scope of this document. However, it is essential to ensure that any files to be processed by Nemo are accessible to the unprivileged user configured to run Nemo.

2 Initial Setup

After deploying Nemo on a server using the *Installation Guide* and starting it as root, follow the procedure below to configure the application to run as an unprivileged user.

Info

The examples provided assume the unprivileged user is *webadmin*. If a different user is to be used, adjust the commands accordingly by replacing *webadmin* with the appropriate username.

As root, add the user *webadmin* to the *nemo* group. If necessary, also add *webadmin* to any other groups required to ensure proper integration with external and third-party systems (e.g. *mongod*).

```
1 /usr/sbin/usermod -G nemo -a webadmin
```

As root, stop Nemo and disable the automatic start:

```
1 systemctl stop nemo
2 systemctl disable nemo
```

As root, change ownership of log files, application files and CDR files to *webadmin*:

```
1 chown -R webadmin /var/log/nemo
2 chown -R webadmin /opt/nemo
3 chown -R /data/cdr
```

As root, move the crontab file to a backup location under the *webadmin* user:

```
1 mv /etc/cron.d/nemo ~webadmin/nemo.crontab_backup
```

As *webadmin* user, copy the Nemo systemctl service file to the systemd user instance location:

```
1 cp /etc/systemd/system/nemo.service ~/.config/systemd/user/
```

As *webadmin* user, edit this file to ensure that the `User=root` line is removed. The edited file should contain:

```
1 [Unit]
2 Description=Nemo
3
4 [Service]
5 ExecStart=/opt/nemo/bin/nemo-watchdog
6 Restart=always
7 RestartSec=5s
8
9 [Install]
10 WantedBy=multi-user.target
```

As *webadmin* user, reload the systemd user instance daemon:

```
1 systemctl --user daemon-reload
```

As *webadmin* user, start Nemo and enable the automatic start:

```
1 systemctl --user start nemo
2 systemctl --user enable nemo
```

As *webadmin* user, verify that the service is running correctly (the process list may vary depending on your deployment):

```
1 systemctl --user status nemo
2 * nemo.service - Nemo
3   Loaded: loaded (/home/webadmin/.config/systemd/user/nemo.service; enabled;
4   ↪ vendor preset: enabled)
5   Active: active (running) since Wed 2025-01-12 11:41:15 CET; 1h 20min ago
6   Main PID: 391015 (nemo-watchdog)
7   CGroup: /user.slice/user-1001.slice/user@1001.service/nemo.service
8           |-391015 /opt/nemo/bin/python /opt/nemo/bin/nemo-watchdog
9           |-391016 /opt/nemo/bin/python /opt/nemo/bin/nemo-broadworks-cdr-csv-
10          ↪ collector
11           |-391017 /opt/nemo/bin/python /opt/nemo/bin/nemo-gui
12           |-391018 /opt/nemo/bin/python /opt/nemo/bin/nemo-rest
13           |-469491 /opt/nemo/bin/python /opt/nemo/bin/nemo-stats-engine
14          ↪ updateStatistics 1 4 broadsoft
15           |-469587 /opt/nemo/bin/python /opt/nemo/bin/nemo-stats-engine
16          ↪ updateStatistics 0 4 broadsoft
17           |-469588 /opt/nemo/bin/python /opt/nemo/bin/nemo-stats-engine
18          ↪ updateStatistics 2 4 broadsoft
19           |-470657 /opt/nemo/bin/python /opt/nemo/bin/nemo-stats-engine
20          ↪ updateStatistics 3 4 broadsoft
21           ~-470658 /opt/nemo/bin/python /opt/nemo/bin/nemo-health-monitor
```

Edit the user's crontab file using the command `crontab -e`, and copy the entries from `~/nemo.crontab_backup`, omitting the user column. Below is an example of a crontab file (note that the content may vary depending on your deployment):

```
1 #Ensure that stats are automatically enabled for all Service Providers
2 */5 * * * *      mongo --eval 'db.getCollection("bw_service_providers").update
3   ↪ ({},{ $set: {"stats": true, "statsPerGroups": true }}, false, true);'
4   ↪ nemo
5 0 1 * * *        /opt/nemo/scripts/nemo-backup-cdr
```

3 Upgrade Procedure

Upgrading the Nemo application requires an administrator with root access (or access via *sudo*) to complete the steps outlined in this chapter for each upgrade. Once these steps are completed, root access will no longer be needed, and the unprivileged user can be used for regular day-to-day operations.

The upgrade procedure is detailed in the *Nemo Release Notes* document corresponding to your installed release. Unless otherwise specified, the upgrade typically involves updating the RPM package using the *rpm* tool.

As root, upgrade the Nemo package:

```
1 rpm -Uvh nemo-package.rpm
```

As root, change ownership of application files to the unprivileged user:

```
1 chown -R webadmin /opt/nemo
```

As *webadmin* user, restart the Nemo application:

```
1 systemctl --user restart nemo
```

As *webadmin* user, verify that the service is running correctly (the process list may vary depending on your deployment) and that the uptime matches the restart time:

```
1 systemctl --user status nemo
2 * nemo.service - Nemo
3   Loaded: loaded (/home/webadmin/.config/systemd/user/nemo.service; enabled;
4           ↪ vendor preset: enabled)
5   Active: active (running) since Wed 2025-01-12 13:11:08 CET; 3s ago
6   Main PID: 508620 (nemo-watchdog)
7   CGroup: /user.slice/user-1001.slice/user@1001.service/nemo.service
8           |-508620 /opt/nemo/bin/python /opt/nemo/bin/nemo-watchdog
9           |-508622 /opt/nemo/bin/python /opt/nemo/bin/nemo-broadworks-cdr-csv-
10              ↪ collector
11              |-508623 /opt/nemo/bin/python /opt/nemo/bin/nemo-gui
12              |-508624 /opt/nemo/bin/python /opt/nemo/bin/nemo-rest
13              |-508625 /opt/nemo/bin/python /opt/nemo/bin/nemo-stats-engine
14              ↪ updateStatistics 0 4 broadsoft
15              |-508626 /opt/nemo/bin/python /opt/nemo/bin/nemo-stats-engine
16              ↪ updateStatistics 1 4 broadsoft
17              |-508627 /opt/nemo/bin/python /opt/nemo/bin/nemo-stats-engine
18              ↪ updateStatistics 2 4 broadsoft
19              |-508628 /opt/nemo/bin/python /opt/nemo/bin/nemo-stats-engine
20              ↪ updateStatistics 3 4 broadsoft
21              ~-508630 /opt/nemo/bin/python /opt/nemo/bin/nemo-health-monitor
```