

# UPGRADING NIAGARA CONTAINERS

*Using docker*

**Assumption: You have a working docker environment up and running**

```
tridium@tridium-virtual-machine:~/niagara$ docker image ls
```

|   | REPOSITORY      | TAG        | IMAGE ID     | CREATED       | SIZE   |
|---|-----------------|------------|--------------|---------------|--------|
| 1 | vykon-fda-amd64 | 4.13.2.18  | 456e91cb8f27 | 10 months ago | 410MB  |
| 2 | vykon-fda-amd64 | 4.13.1.14  | 9736cce5525a | 11 months ago | 391MB  |
| 3 | vykon-fda-amd64 | 4.13.0.186 | 2c2b7bfa6a15 | 12 months ago | 405MB  |
| 4 | hello-world     | latest     | 9c7a54a9a43c | 17 months ago | 13.3kB |

## See what docker images are loaded

Using the command: `docker image ls`

Notice there are 4 images loaded into the docker system

4.13.2.18 (U2), 4.13.1.14 (U1), 4.13.0.186 (GA), and hello-world

```
tridium@tridium-virtual-machine:~/niagara$ docker volume ls
DRIVER      VOLUME NAME
local       niagara_niagara-user-home
tridium@tridium-virtual-machine:~/niagara$
```

## See what docker volumes are used

Using the command: `docker volume ls`

Notice it's using `niagara_niagara-user-home` that is mapped in the `docker-compose.yml`

**volumes:**

- `niagara-user-home:/home/niagara`

```
tridium@tridium-virtual-machine:~/NiagaraContainerImages$ docker load<vykon-fda-amd64-4.14.0.162.tar
4a1518ebc26e: Loading layer [=====>] 75.19MB/75.19MB
0da75023adea: Loading layer [=====>] 67.86MB/67.86MB
f12d5ea90c4f: Loading layer [=====>] 1.659MB/1.659MB
e27f25c4915f: Loading layer [=====>] 4.096kB/4.096kB
06e94a0cabe4: Loading layer [=====>] 3.072kB/3.072kB
0f7d796aee40: Loading layer [=====>] 3.072kB/3.072kB
ef54f5a60d74: Loading layer [=====>] 136.5MB/136.5MB
5f604a116c7f: Loading layer [=====>] 123.8MB/123.8MB
86f184d8f1ef: Loading layer [=====>] 2.56kB/2.56kB
39513d1309b7: Loading layer [=====>] 46.59kB/46.59kB
77e3d6e8463e: Loading layer [=====>] 15.87kB/15.87kB
03fc19d57226: Loading layer [=====>] 21.5kB/21.5kB
a6de71766449: Loading layer [=====>] 39.94kB/39.94kB
15a61fb92d87: Loading layer [=====>] 34.3kB/34.3kB
21e61d50c794: Loading layer [=====>] 34.3kB/34.3kB
d04d6f0fd5b3: Loading layer [=====>] 1.226MB/1.226MB
Loaded image: vykon-fda-amd64:4.14.0.162
```

## Load new docker image from Tridium

Using the command: `docker load <`

I load the .tar file provided by the systems integrator

In this example `vykon-fda-amd64-4.14.0.162.tar` file

Another example `nigara-fda-amd64:4.14.0.162.tar` file



```
cd NiagaraContainerImages/  
tridium@tridium-virtual-machine:~/NiagaraContainerImages$
```



```
sudo docker load<niagara-fda-amd64-4.15.0.90_1.5.94.tar
```

```
tridium@tridium-virtual-machine:~/NiagaraContainerImages$ sudo docker load<niagara-fda-amd64-4.15.0.90_1.5.94.tar  
7237715e865b: Loading layer [=====>] 85.42MB/85.42MB  
03bd0a355ef7: Loading layer [=====>] 1.659MB/1.659MB  
94da790ac8f7: Loading layer [=====>] 4.096kB/4.096kB  
5e59ada782b0: Loading layer [=====>] 3.072kB/3.072kB  
dd93bc5977a1: Loading layer [=====>] 3.072kB/3.072kB  
0e651413223f: Loading layer [=====>] 3.072kB/3.072kB  
398cc71fdb23: Loading layer [=====>] 140MB/140MB  
1367c59a85a4: Loading layer [=====>] 126MB/126MB  
7179be94483d: Loading layer [=====>] 2.56kB/2.56kB  
6e5a335e8972: Loading layer [=====>] 46.08kB/46.08kB  
29a1873c5381: Loading layer [=====>] 15.87kB/15.87kB  
9493418f1245: Loading layer [=====>] 21.5kB/21.5kB  
62c2e3256c15: Loading layer [=====>] 39.94kB/39.94kB  
36f7eb7a4abc: Loading layer [=====>] 34.3kB/34.3kB  
51c456e1a19c: Loading layer [=====>] 34.3kB/34.3kB  
Loaded image: niagara/fda/amd64/base:4.15.0.90_1.5.94-f39d62c5e033
```

```
image: niagara/fda/amd64/base:4.15.0.90_1.5.94-f39d62c5e033
```

5

```
tridium@tridium-virtual-machine:~/niagara$ docker image ls
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
vykon-fda-amd64     4.14.0.162         bb51a5298092       3 months ago      402MB
vykon-fda-amd64     4.13.2.18          456e91cb8f27       10 months ago     410MB
vykon-fda-amd64     4.13.1.14          9736cce5525a       11 months ago     391MB
vykon-fda-amd64     4.13.0.186         2c2b7bfa6a15       12 months ago     405MB
hello-world         latest             9c7a54a9a43c       17 months ago     13.3kB
tridium@tridium-virtual-machine:~/niagara$
```

## Confirm Docker Loaded image for use

Using the command: `docker image ls`

Notice image `Vykon-fda-amd64 4.14.0.162` is now at the top of the list, there are 5 images I can use.

```
26 # image: vykon-fda-amd64:4.13.0.186 # Specify the provided image name and version, for example: niagara/fda/amd64/base:4.13.0.182_1.4.67.  
27 # image: vykon-fda-amd64:4.13.0.186 # use docker load<~/NiagaraContainerImages/Niagara_NDA_Amd64_Base_4.13.0.186.tar  
28 # image: vykon-fda-amd64:4.13.1.14 # use docker load<~/NiagaraContainerImages/Niagara_NDA_Amd64_Base_4.13.1.14.tar  
29 # image: vykon-fda-amd64:4.13.2.18 # use docker load<~/NiagaraContainerImages/Niagara_NDA_Amd64_Base_4.13.2.18.tar  
30 image: vykon-fda-amd64:4.14.0.162 # use docker load<~/NiagaraContainerImages/Niagara_NDA_Amd64_Base_4.14.0.162.tar
```

# need to use **docker load**<~/NiagaraContainerImages/vykon-fda-amd64-4.14.0.162.tar  
# ~/NiagaraContainerImages is where I put the vykon-fda-amd64-4.14.0.162.tar  
**image: vykon-fda-amd64:4.14.0.162**

## Edit the docker-compose.yml file

- In this example I copied the active image line, Then commented it out with the #
- Pasted it back and change the image file name and tag **Image: Vykon-fda-amd64:4.14.0.162**

This docker-compose document it's very easy for me to switch between Niagara versions just by adding in or removing the # from the line.

Another Example **image:** niagara/fda/amd64/base:4.15.0.122\_1.5.105-e9ae5bce1696

```

tridium@tridium-virtual-machine:~$ cd niagara
tridium@tridium-virtual-machine:~/niagara$ docker compose up
WARN[0000] /home/tridium/niagara/docker-compose.yml: the attribute `version` is obsolete, it will be ignored, please remove it to avoid potential confusion
[+] Running 1/0
  ✓ Container niagara-niagara-1 Created 0.0s
Attaching to niagara-1
niagara-1 | INFO | init.sh | Initializing Niagara container
niagara-1 | INFO | init.sh | Container is starting with root-level commands
niagara-1 | INFO | init.sh | Setting timezone to America/New_York
niagara-1 | INFO | copy_modules.sh | Checking for removed modules
niagara-1 | INFO | copy_modules.sh | Copying core Niagara modules to /home/niagara/modules
niagara-1 | INFO | init.sh | niagarad.sh running as PID 1561
niagara-1 | INFO | niagarad.sh | Container version is 1.5.71
niagara-1 | INFO | niagarad.sh | Hard open file limit is 1048576
niagara-1 | INFO | niagarad.sh | Starting niagarad.
niagara-1 | INFO | niagarad.sh | niagarad running as PID 1564
niagara-1 | INFO [12:04:01 10-Oct-24 EDT][crypto.registry] module signature registry up-to-date
niagara-1 | INFO [12:04:01 10-Oct-24 EDT][crypto.registry] module signature registry load complete (85ms)
niagara-1 | INFO [12:04:01 10-Oct-24 EDT][niagarad] starting, niagara_user_home=/home/niagara
niagara-1 | WARNING [12:04:01 10-Oct-24 EDT][webserver] using default TLS server certificate 'default' is not recommended
niagara-1 | INFO [12:04:02 10-Oct-24 EDT][webserver] web server threads started [threadCount = 5]
niagara-1 | INFO [12:04:02 10-Oct-24 EDT][stationRegistry] station registry starting
niagara-1 | INFO [12:04:02 10-Oct-24 EDT][stationRegistry] station Docker watchdog thread started [tid = 32]
niagara-1 | INFO [12:04:02 10-Oct-24 EDT][niagarad] startup complete (3314ms)
niagara-1 | INFO [12:04:02 10-Oct-24 EDT][stationRegistry] station Docker starting
niagara-1 | INFO [12:04:19 10-Oct-24 EDT][stationRegistry] station Docker startup complete

```

# Start the container using docker compose up

Idrop down into the directory `niagara` # The location of the compose file

Using the command: `docker compose up`

Platform Administration

View Details

Update Authentication

System Passphrase

Change HTTP Port

Change TLS Settings

Change Date/Time

Advanced Options

Change Output Settings

Syslog Configuration

View Daemon Output

View System Log

Configure Runtime Profiles

Backup

Commissioning

Reboot

Baja Version

Daemon Version

System Home

User Home

Host

Daemon HTTP Port

Daemon HTTPS Port

Host ID

Host ID Status

Model

Product

Serial Number

Local Date

Local Time

Local Time Zone

Operating System

Niagara Runtime

Architecture

Enabled Runtime Profiles

Java Virtual Machine

Niagara Stations Enabled

Tridium 4.14.0.162

4.14.0.162

/opt/niagara

/home/niagara

192.168.206.129 (Docker)

3011 (disabled in TLS settings)

5011

Nre-0E04-47DB-FD90-4D05-912F-86D1-74A4-7AE9

Registered

n4container (1.5.71)

n4container

None

10-Oct-24

12:11 Eastern Daylight Time

America/New\_York (-5/-4)

Niagara Container (1.5.71)

tridium-linux-amd64-nre-core-fda (4.14.0.162)

x64

rt,ux,wb

azul-jre-linux-headless-amd64 (Azul Systems, Inc. 1.8.0.412.20)

enabled

# Confirm via Workbench's Platform connection

I'm using a Ubuntu VM to run my docker environment, that does not contain Niagara Workbench  
Using localhost as the IP address on my PC in workbench, I'll connect to the platform to verify the update  
You would use the IP address of your environment.

TRIDIUM

# Upgrading to 4.15

A Breaking change for existing containers upgrading to 4.15

## 4.15 No longer runs as the root user

Previous version of Niagara containers used root in order to run the platform. For security reasons Niagara 4.15 no longer does.

This will cause an edge case when upgrading from [existing](#) containers to 4.15

For example: Upgrading from 4.14 to 4.15 you will encounter the following error, with the station unable to start.

```
/niagara/scripts/setup_nre_properties.sh: line 67:  
/home/niagara/etc/nre.properties: Permission denied
```

# Prior to 4.15 container upgrade

In order to upgrade to N4.15 you must first set the owner of that file prior to using the 4.15 image.

To fix this, prior to upgrading the FDA container to the 4.15 container from a previous version, the following steps should be taken to fix an issue with the nre.properties file:

Start the docker container using the previous version (assuming docker compose is being used)



```
docker compose up -d
```

# Prior to 4.15 container upgrade

Use this command to find the ID of the container process



`docker ps`

```
tridium@tridium-virtual-machine:~/niagara$ docker compose up -d
[+] Running 1/1
✓ Container niagara-niagara-1 Started 0.9s
tridium@tridium-virtual-machine:~/niagara$ docker ps
```

| CONTAINER ID | IMAGE                      | COMMAND                  | CREATED        | STATUS        | PORTS                                                                                                                                                                  |
|--------------|----------------------------|--------------------------|----------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| bac32bd6bb07 | vykon-fda-amd64:4.14.0.162 | "/niagara/scripts/in..." | 14 seconds ago | Up 12 seconds | 0.0.0.0:443->443/tcp, :::443->443/tcp, 0.0.0.0:4911->4911/tcp, :::4911->4911/tcp, 0.0.0.0:5011->5011/tcp, :::5011->5011/tcp, 0.0.0.0:8443->8443/tcp, :::8443->8443/tcp |

niagara-niagara-1

bac32bd6bb07 is the container ID in this example

# Prior to 4.15 container upgrade

1 Start a shell into the container:  `docker exec -it bac32bd6bb07 bash`

```
tridium@tridium-virtual-machine:~/niagara$ docker exec -it bac32bd6bb07 bash
root@bac32bd6bb07:/# ls -l /home/niagara/etc
total 52
drwx----- 2 niagara niagara 4096 Oct 18 2023 key_material
-rw-rw-r-- 1 niagara niagara 147 Nov 8 2023 license.properties
-rw-r--r-- 1 root root 71 Nov 12 11:20 nre.properties
-rw-rw-r-- 1 niagara niagara 3091 Nov 11 07:53 platform.bog
-rw-rw-r-- 1 niagara niagara 3091 Nov 11 07:52 platform_backup_241111_0752.bog
-rw-rw-r-- 1 niagara niagara 30354 Jul 18 2023 system.properties
```

2 List the files inside the home/niagara/etc folder:  `ls -l /home/niagara/etc`

# Prior to 4.15 container upgrade

Change the file ownership:



```
chown niagara:niagara /home/niagara/etc/nre.properties
```

```
root@bac32bd6bb07:/# chown niagara:niagara /home/niagara/etc/nre.properties
```

You can now shut the container down, edit the docker compose file to now start the 4.15 image.

Note: 4.15 has other security improvements such as store passwords are now hashed. Moving back to previous version could cause your passwords to be erased.

# 4.15 user passwords are now hashes

Previous versions of Niagara, Station Users passwords were encrypted with the passphrase. For security best practice Niagara 4.15 moved to using hashes.

During first time bootup of Niagara 4.15 when upgrading from [Previous Niagara Version](#), it will convert the passwords to password hashes.

The impact of this is if you try to run the station on something lower than 4.15, you will see errors in the console, and the station will not start.

You can recover from this by using Workbench to revert to 4.14, removing the passphrase, and entering the passwords.

# Clone Detection

# Registered Hidden Files

| var / lib / docker / volumes / ni... me / _data / security / <b>subscription</b>                    |           |        |             |             |               |  |
|-----------------------------------------------------------------------------------------------------|-----------|--------|-------------|-------------|---------------|--|
| Name                                                                                                | Size      | Type   | Permissions | Modified    | Detailed Type |  |
|  licenses          | 1 item    | Folder | drwxrwxr-x  | 20 Nov 2024 | Folder        |  |
|  certificates      | 1 item    | Folder | drwxrwxr-x  | 20 Nov 2024 | Folder        |  |
|  .refreshIncrement | 87 bytes  | Binary | -rw-rw-r--  | 29 Jan 2025 | Binary        |  |
|  .kr               | 409 bytes | Binary | -rw-rw-r--  | 20 Nov 2024 | Binary        |  |
|  .registered      | 26 bytes  | Binary | -rw-rw-r--  | 20 Nov 2024 | Binary        |  |
|  .restoreId      | 151 bytes | Binary | -rw-rw-r--  | 20 Nov 2024 | Binary        |  |
|  .ecKeyPair      | 1.2 kB    | Binary | -rw-rw-r--  | 20 Nov 2024 | Binary        |  |
|  nreId           | 45 bytes  | Binary | -rw-rw-r--  | 20 Nov 2024 | Binary        |  |

# Cloned Hidden Files

| var / lib / docker / volumes / ni... me / _data / security / subscription                             |           |             |  |  |
|-------------------------------------------------------------------------------------------------------|-----------|-------------|--|--|
| Name ^                                                                                                | Size      | Modified    |  |  |
|  certificates        | 0 items   | 11 Nov 2024 |  |  |
|  licenses            | 0 items   | 11 Nov 2024 |  |  |
|  nreId               | 45 bytes  | 18 Oct 2023 |  |  |
|  .cloned             | 26 bytes  | 7 Nov 2024  |  |  |
|  .ecKeyPair         | 1.2 kB    | 16 Aug 2024 |  |  |
|  .kr               | 409 bytes | 18 Oct 2023 |  |  |
|  .refreshIncrement | 87 bytes  | 11 Nov 2024 |  |  |
|  .restoreId        | 151 bytes | 11 Nov 2024 |  |  |

# Backup can only be restored to the **SAME** nreid

| var / lib / docker / volumes / ni... me / _data / security / subscription |           |        |             |             |               |  |
|---------------------------------------------------------------------------|-----------|--------|-------------|-------------|---------------|--|
| Name                                                                      | Size      | Type   | Permissions | Modified    | Detailed Type |  |
| licenses                                                                  | 1 item    | Folder | drwxrwxr-x  | 20 Nov 2024 | Folder        |  |
| certificates                                                              | 1 item    | Folder | drwxrwxr-x  | 20 Nov 2024 | Folder        |  |
| .refreshIncrement                                                         | 87 bytes  | Binary | -rw-rw-r--  | 29 Jan 2025 | Binary        |  |
| .kr                                                                       | 409 bytes | Binary | -rw-rw-r--  | 20 Nov 2024 | Binary        |  |
| .registered                                                               | 26 bytes  | Binary | -rw-rw-r--  | 20 Nov 2024 | Binary        |  |
| .restoreId                                                                | 151 bytes | Binary | -rw-rw-r--  | 20 Nov 2024 | Binary        |  |
| .ecKeyPair                                                                | 1.2 kB    | Binary | -rw-rw-r--  | 20 Nov 2024 | Binary        |  |
| nreid                                                                     | 45 bytes  | Binary | -rw-rw-r--  | 20 Nov 2024 | Binary        |  |