



Upgrading IoT FND OVA



Note Ensure to upgrade the DB and the docker server image first before upgrading the IoT FND and FD container images.

To upgrade the IoT FND OVA, follow the upgrade sequence given below:

1. Upgrade the DB and the docker server image using rpm scripts.
For more information, refer to [Upgrading the Database and Docker Server Image, on page 5](#).
2. Upgrade the IoT FND and FD container images.
For more information, refer to [Upgrading IoT FND and FD Container Images, on page 17](#).
3. Restart Postgres service if the current IoT FND release is prior to 4.9.1 and the target IoT FND release is 4.9.1 or above.



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- Note**
- Postgres service restart is not required if the target IoT FND release is greater than 4.9.1. In this case, we assume that during the upgrade to IoT FND 4.9.1, the postgres service is already restarted.
 - Postgres service restart is a must if you are directly upgrading to 4.10 from a release prior to 4.9.1.
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Pre-Upgrade Checklist

The section identifies the tasks that you must perform before you begin the upgrade to ensure successful upgrade and limited downtime.

Step 1 Take a snapshot of the existing VM before you upgrade.

This helps in restoring if there is an upgrade failure.

Step 2 Take a backup of the PostgreSQL DB.

Note For any clarification on backup procedure, contact your DB administrator.

Step 3 Take a backup of **cgms.properties** file and **cgms_keystore** file in the location, `/opt/fnd/data/`.

You can either SCP these files to another server for backup or you can copy in the same or different folder.

```
root@iot-fnd:~[root@iot-fnd ~]#
root@iot-fnd:~[root@iot-fnd ~]# cd /opt/fnd/data
root@iot-fnd:/opt/fnd/data[root@iot-fnd data]#
root@iot-fnd:/opt/fnd/data[root@iot-fnd data]#ls
cgms_keystore  cgms.properties  cisco-sudi-ca.pem  userPropertyTypes.xml
root@iot-fnd:/opt/fnd/data[root@iot-fnd data]#
root@iot-fnd:/opt/fnd/data[root@iot-fnd data]# cp cgms.properties cgms.properties_backup_09May2022
[root@iot-fnd data]# keytool -importkeystore -srckeystore cgms_keystore -destkeystore
cgms_keystore_backup_9May2022 -deststoretype PKCS12
Importing keystore cgms_keystore to cgms_keystore_backup_9May2022...
Enter destination keystore password:
Re-enter new password:
Enter source keystore password:
Entry for alias cgms successfully imported.
Entry for alias cisco_sudi successfully imported.
Entry for alias jmarconi successfully imported.
Import command completed: 3 entries successfully imported, 0 entries failed or cancelled
[root@iot-fnd data]#
[root@iot-fnd data]# ls
cgms_keystore                cgms_keystore.selfsigned  cgms.properties_backup_09May2022
fnd_psk.keystore
cgms_keystore_backup_9May2022  cgms.properties          cisco-sudi-ca.pem
userPropertyTypes.xml
[root@iot-fnd data]#
```

a) During the IoT FND container upgrade, the following files get overwritten in the directories mentioned below:

- Directory — `/opt/cgms/server/cgms/conf/`:
 - `jbossas.keystore.password`
 - `jbossas.keystore`
 - `VAULT.dat`
 - `vault.keystore`
- Directory — `/opt/cgms/server/cgms/deploy/`:
 - `security-service.xml` file

Backup can be done in the same directory using different name or backup in a different directory or backup and store the files in the SCP server.

For example, taking backup in the same directory:

```
Login to the FND container
[root@iot-fnd ~]# docker exec -it fnd-container /bin/bash
[root@fnd-server ~]#
```

```
[root@fnd-server /]# cp /opt/cgms/server/cgms/conf/jbossas.keystore.password
/opt/cgms/server/cgms/conf/jbossas.keystore.password.bkp1
[root@fnd-server /]# cp /opt/cgms/server/cgms/conf/jbossas.keystore
/opt/cgms/server/cgms/conf/jbossas.keystore.bkp1
[root@fnd-server /]# cp /opt/cgms/server/cgms/conf/vault.keystore
/opt/cgms/server/cgms/conf/vault.keystore.bkp1
[root@fnd-server /]# cp /opt/cgms/server/cgms/conf/VAULT.dat
/opt/cgms/server/cgms/conf/VAULT.dat.bkp1
[root@fnd-server /]# cp /opt/cgms/server/cgms/deploy/security-service.xml
/opt/cgms/server/cgms/deploy/security-service.xml.bkp1
[root@fnd-server /]#
```

- b) If you are using *userpropertyTypes.xml* to define custom properties for backup, then follow the steps that are mentioned in the workaround of the bug ID: CSCwc12435. This will be fixed in IoT FND release 4.9 or later.

Step 4

Run the following commands and check the output before you start the upgrade process.

- /opt/scripts/status.sh

```
[root@iot-fnd ~]# /opt/scripts/status.sh
```

- postgresql-12.service - PostgreSQL 12 database server
Loaded: loaded (/usr/lib/systemd/system/postgresql-12.service; enabled; vendor preset: disabled)

```
Active: active (running) since Mon 2022-05-09 02:01:29 PDT; 2h 6min ago
```

```
Docs: https://www.postgresql.org/docs/12/static/
```

```
Main PID: 27638 (postmaster)
```

```
Tasks: 26
```

```
Memory: 250.5M
```

```
CGroup: /system.slice/postgresql-12.service
```

- influxdb.service - InfluxDB is an open-source, distributed, time series database
Loaded: loaded (/usr/lib/systemd/system/influxdb.service; enabled; vendor preset: disabled)
Active: active (running) since Mon 2022-05-09 02:02:39 PDT; 2h 5min ago
Docs: https://docs.influxdata.com/influxdb/
Main PID: 27892 (influxd)
Tasks: 21
Memory: 219.0M

- kapacitor.service - Time series data processing engine.
Loaded: loaded (/usr/lib/systemd/system/kapacitor.service; enabled; vendor preset: disabled)
Active: active (running) since Mon 2022-05-09 02:02:06 PDT; 2h 5min ago
Docs: https://github.com/influxdb/kapacitor
Main PID: 27805 (kapacitor)
Tasks: 14
Memory: 21.0M

```
fnd-container is running, pid=61255
```

CONTAINER ID	NAME	CPU %	MEM USAGE / LIMIT	MEM %
a02e6388607d	fnd-container	6.44%	2.612GiB / 23.38GiB	11.17%

```
fogd-container is running, pid=63469
```

CONTAINER ID	NAME	CPU %	MEM USAGE / LIMIT	MEM %
a40aa29e2392	fogd-container	6.38%	2.18GiB / 23.38GiB	9.32%

```
[root@iot-fnd ~]#
```

- docker version

```
[root@iot-fnd ~]# docker version
Client: Docker Engine - Community
Version:      19.03.15
API version:  1.40
Go version:   go1.13.15
Git commit:   99e3ed8919
Built:        Sat Jan 30 03:17:57 2021
OS/Arch:     linux/amd64
Experimental: false

Server: Docker Engine - Community
Engine:
Version:      19.03.15
API version:  1.40 (minimum version 1.12)
Go version:   go1.13.15
Git commit:   99e3ed8919
Built:        Sat Jan 30 03:16:33 2021
OS/Arch:     linux/amd64
Experimental: false
containerd:
Version:      1.4.4
GitCommit:    05f951a3781f4f2c1911b05e61c160e9c30eaa8e
runc:
Version:      1.0.0-rc93
GitCommit:    12644e614e25b05da6fd08a38ffa0cfe1903fdec
docker-init:
Version:      0.18.0
GitCommit:    fec3683
You have new mail in /var/spool/mail/root
[root@iot-fnd ~]#
```

- /opt/fnd/scripts/fnd-container.sh status

```
[root@iot-fnd ~]# /opt/fnd/scripts/fnd-container.sh status
fnd-container is running, pid=61255
CONTAINER ID        NAME                CPU %               MEM USAGE / LIMIT   MEM %
NET I/O           BLOCK I/O          PIDS
a02e6388607d      fnd-container      6.47%              2.613GiB / 23.38GiB 11.18%
17MB / 13.8MB     20.3MB / 2.64MB   592
[root@iot-fnd ~]#
You have new mail in /var/spool/mail/root
[root@iot-fnd ~]#
```

- docker exec -it fnd-container /etc/init.d/cgms status

```
[root@iot-fnd ~]# docker exec -it fnd-container /etc/init.d/cgms status
IoT-FND Version 4.7.2-8
05-09-2022 04:09:46 PDT: INFO: IoT-FND database server: 192.68.5.1
05-09-2022 04:09:47 PDT: INFO: IoT-FND database connection verified.
05-09-2022 04:09:47 PDT: INFO: IoT FND timeseries database server: 192.68.5.1
05-09-2022 04:09:47 PDT: INFO: IoT FND kapacitor server: 192.68.5.1
05-09-2022 04:09:48 PDT: INFO: IoT-FND timeseries database/kapacitor connection verified.
05-09-2022 04:09:49 PDT: INFO: IoT-FND application server is up and running.
05-09-2022 04:09:50 PDT: INFO: IoT-FND is up and running.
[root@iot-fnd ~]#
```

- rpm -qa | grep -i postgres

```
root@iot-fnd:/opt/fnd/data[root@iot-fnd data]# rpm -qa | grep -i postgres
postgresql96-devel-9.6.15-1PGDG.rhel7.x86_64
postgresql96-libs-9.6.15-1PGDG.rhel7.x86_64
postgresql96-server-9.6.15-1PGDG.rhel7.x86_64
postgresql96-9.6.15-1PGDG.rhel7.x86_64
cgms-postgres-4.5.1-11.x86_64
```

```
postgresql96-contrib-9.6.15-1PGDG.rhel7.x86_64
root@iot-fnd:/opt/fnd/data[root@iot-fnd data]#
```

Upgrading the Database and Docker Server Image

This section provides steps for upgrading the database and the docker server image by running the `rpm` upgrade scripts for releases 4.7.0 to later versions and 4.5.1 to later versions. By running the `rpm` scripts, you automatically integrate the DB with IoT FND scripts, upgrade the DB, and upgrade the docker server (Community Edition) image.



Note IoT FND version 4.5.1 provides the option to manually upgrade the DB and docker server image instead of running the Cisco `rpm` scripts. For more information, refer to [Manual Upgrade Option in FND 4.5.1](#).



Note IoT FND OVA upgrade will NOT upgrade the RHEL OS version. The RHEL version differs for different versions of IoT FND as in the table below. After upgrading the OVA, it is recommended to upgrade the OS sooner than later. Although IoT FND is a secure application, OS security and patches must be regularly updated with Cisco's guidance.

Table 1: List of IoT FND and the bundled Postgres, Docker, and RHEL OS versions:

IoT FND Version	Postgres Version	Docker Server Version	RHEL OS Version
4.11.0	12.12	19.03.15	8.8
4.10.0	12.12	19.03.15	8.7
4.9.1	12.12	19.03.15	8.6
4.9.0	12.9	19.03.15	8.6
4.8.1	12.9	19.03.15	8.5
4.8.0	12.5	19.03.15	7.7
4.7.2	12.5	19.03.15	7.7
4.7.1	12.5	19.03.15	7.7
4.7.0	12.4	18.09.6	7.7
4.5.1	9.6	18.09.6	7.5



Note Starting from FND 4.8.1 release, all python scripts are compatible only for Python 3 which comes as default python interpreter in RHEL 8.x. It is recommended to install Python 3.6 manually if IoT FND OVA is upgraded to 4.8.1 or higher without base OS upgrade.

Step 1 Obtain the IoT FND upgrade scripts from [Cisco](#).

Step 2 Check the RHEL OS version before upgrading IoT FND OVA to 4.7.1 or higher.

```
[root@fnd451testupgrade ~]# hostnamectl
  Static hostname: fnd451testupgrade
    Icon name: computer-vm
    Chassis: vm
  Machine ID: 58eb8d728d834d28ad426eca3c9b9c4e
    Boot ID: 40511dab9f4b4beaa8de82fb105423c9
  Virtualization: vmware
  Operating System: Red Hat Enterprise Linux
    CPE OS Name: cpe:/o:redhat:enterprise_linux:7.5:GA:server
    Kernel: Linux 3.10.0-862.el7.x86_64
  Architecture: x86-64
[root@fnd451testupgrade ~]#r
```

- If the RHEL version on the Linux server is lesser than 7.7, then use the following steps to upgrade. You can either do an [automatic](#) or [manual](#) upgrade.
- If the RHEL version on the Linux server is 7.7 or above, then you can skip the steps below.

a) **Method 1 — Automatic Upgrade:** For this method, you require subscription to RHEL subscription-manager and active internet connection.

Run the following command to upgrade the container-selinux package.

```
subscription-manager repos --enable=rhel-7-server-extras-rpms
yum update container-selinux
```

Example

```
[root@fnd451testupgrade ~]# subscription-manager repos --enable=rhel-7-server-extras-rpms
Repository 'rhel-7-server-extras-rpms' is enabled for this system.
[root@fnd451testupgrade ~]# yum update container-selinux
Loaded plugins: langpacks, product-id, search-disabled-repos, subscription-manager
https://download.postgresql.org/pub/repos/yum/9.4/redhat/rhel-7Server-x86_64/repodata/repomd.xml:
[Errno 14] HTTPS Error 404 - Not Found
Trying other mirror.
To address this issue please refer to the below knowledge base article

https://access.redhat.com/articles/1320623
```

If above article doesn't help to resolve this issue please open a ticket with Red Hat Support.

```
Resolving Dependencies
--> Running transaction check
---> Package container-selinux.noarch 2:2.42-1.gitad8f0f7.el7 will be updated
---> Package container-selinux.noarch 2:2.119.2-1.911c772.el7_8 will be an update
--> Processing Dependency: selinux-policy >= 3.13.1-216.el7 for package:
2:container-selinux-2.119.2-1.911c772.el7_8.noarch
--> Processing Dependency: selinux-policy-base >= 3.13.1-216.el7 for package:
2:container-selinux-2.119.2-1.911c772.el7_8.noarch
--> Processing Dependency: selinux-policy-targeted >= 3.13.1-216.el7 for package:
2:container-selinux-2.119.2-1.911c772.el7_8.noarch
```

```

--> Running transaction check
---> Package selinux-policy.noarch 0:3.13.1-192.el7 will be updated
---> Package selinux-policy.noarch 0:3.13.1-268.el7_9.2 will be an update
--> Processing Dependency: libsemanage >= 2.5-13 for package:
selinux-policy-3.13.1-268.el7_9.2.noarch
--> Processing Dependency: policycoreutils >= 2.5-24 for package:
selinux-policy-3.13.1-268.el7_9.2.noarch
---> Package selinux-policy-targeted.noarch 0:3.13.1-192.el7 will be updated
---> Package selinux-policy-targeted.noarch 0:3.13.1-268.el7_9.2 will be an update
--> Running transaction check
---> Package libsemanage.x86_64 0:2.5-11.el7 will be updated
--> Processing Dependency: libsemanage = 2.5-11.el7 for package:
libsemanage-python-2.5-11.el7.x86_64
---> Package libsemanage.x86_64 0:2.5-14.el7 will be an update
--> Processing Dependency: libselinux >= 2.5-14 for package: libsemanage-2.5-14.el7.x86_64
--> Processing Dependency: libsepol >= 2.5-10 for package: libsemanage-2.5-14.el7.x86_64
---> Package policycoreutils.x86_64 0:2.5-22.el7 will be updated
--> Processing Dependency: policycoreutils = 2.5-22.el7 for package:
policycoreutils-python-2.5-22.el7.x86_64
---> Package policycoreutils.x86_64 0:2.5-34.el7 will be an update
--> Processing Dependency: libselinux-utils >= 2.5-14 for package: policycoreutils-2.5-34.el7.x86_64
--> Running transaction check
---> Package libselinux.x86_64 0:2.5-12.el7 will be updated
--> Processing Dependency: libselinux(x86-64) = 2.5-12.el7 for package:
libselinux-python-2.5-12.el7.x86_64
---> Package libselinux.x86_64 0:2.5-15.el7 will be an update
---> Package libselinux-utils.x86_64 0:2.5-12.el7 will be updated
---> Package libselinux-utils.x86_64 0:2.5-15.el7 will be an update
---> Package libsemanage-python.x86_64 0:2.5-11.el7 will be updated
---> Package libsemanage-python.x86_64 0:2.5-14.el7 will be an update
---> Package libsepol.x86_64 0:2.5-8.1.el7 will be updated
---> Package libsepol.x86_64 0:2.5-10.el7 will be an update
---> Package policycoreutils-python.x86_64 0:2.5-22.el7 will be updated
---> Package policycoreutils-python.x86_64 0:2.5-34.el7 will be an update
--> Processing Dependency: setools-libs >= 3.3.8-4 for package:
policycoreutils-python-2.5-34.el7.x86_64
--> Running transaction check
---> Package libselinux-python.x86_64 0:2.5-12.el7 will be updated
---> Package libselinux-python.x86_64 0:2.5-15.el7 will be an update
---> Package setools-libs.x86_64 0:3.3.8-2.el7 will be updated
---> Package setools-libs.x86_64 0:3.3.8-4.el7 will be an update
--> Finished Dependency Resolution

```

Dependencies Resolved

Package	Repository	Arch	Version	Size
Updating:				
container-selinux		noarch		
2:2.119.2-1.911c772.el7_8			rhel-7-server-extras-rpms	
40 k				
Updating for dependencies:				
libselinux		x86_64	2.5-15.el7	
	rhel-7-server-rpms			162 k
libselinux-python		x86_64	2.5-15.el7	
	rhel-7-server-rpms			236 k
libselinux-utils		x86_64	2.5-15.el7	
	rhel-7-server-rpms			151 k
libsemanage		x86_64	2.5-14.el7	
	rhel-7-server-rpms			151 k
libsemanage-python		x86_64	2.5-14.el7	
	rhel-7-server-rpms			113 k

libsepol	x86_64	2.5-10.e17
	rhel-7-server-rpms	297 k
policycoreutils	x86_64	2.5-34.e17
	rhel-7-server-rpms	917 k
policycoreutils-python	x86_64	2.5-34.e17
	rhel-7-server-rpms	457 k
selinux-policy	noarch	3.13.1-268.e17_9.2
	rhel-7-server-rpms	498 k
selinux-policy-targeted	noarch	3.13.1-268.e17_9.2
	rhel-7-server-rpms	7.0 M
setools-libs	x86_64	3.3.8-4.e17
	rhel-7-server-rpms	620 k

Transaction Summary

Upgrade 1 Package (+11 Dependent packages)

Total download size: 11 M

Is this ok [y/d/N]: y

Downloading packages:

No Presto metadata available for rhel-7-server-rpms

No Presto metadata available for rhel-7-server-extras-rpms

(1/12): container-selinux-2.119.2-1.911c772.e17_8.noarch.rpm	40 kB	00:00:01
(2/12): libselinux-2.5-15.e17.x86_64.rpm	162 kB	00:00:01
(3/12): libselinux-python-2.5-15.e17.x86_64.rpm	236 kB	00:00:01
(4/12): libselinux-utils-2.5-15.e17.x86_64.rpm	151 kB	00:00:01
(5/12): libsemanage-2.5-14.e17.x86_64.rpm	151 kB	00:00:01
(6/12): libsemanage-python-2.5-14.e17.x86_64.rpm	113 kB	00:00:01
(7/12): libsepol-2.5-10.e17.x86_64.rpm	297 kB	00:00:01
(8/12): policycoreutils-python-2.5-34.e17.x86_64.rpm	457 kB	00:00:01
(9/12): policycoreutils-2.5-34.e17.x86_64.rpm	917 kB	00:00:02
(10/12): selinux-policy-3.13.1-268.e17_9.2.noarch.rpm	498 kB	00:00:02
(11/12): setools-libs-3.3.8-4.e17.x86_64.rpm	620 kB	00:00:02
(12/12): selinux-policy-targeted-3.13.1-268.e17_9.2.noarch.rpm	7.0 MB	00:00:08

Total

679 kB/s | 11 MB 00:00:15

Running transaction check

Running transaction test

Transaction test succeeded

Running transaction

Updating	: libsepol-2.5-10.e17.x86_64	1/24
Updating	: libselinux-2.5-15.e17.x86_64	2/24
Updating	: libsemanage-2.5-14.e17.x86_64	3/24
Updating	: libselinux-utils-2.5-15.e17.x86_64	4/24
Updating	: policycoreutils-2.5-34.e17.x86_64	5/24
Updating	: selinux-policy-3.13.1-268.e17_9.2.noarch	

Updating	: selinux-policy-targeted-3.13.1-268.el7_9.2.noarch	6/24
Updating	: libsemanage-python-2.5-14.el7.x86_64	7/24
Updating	: libselinux-python-2.5-15.el7.x86_64	8/24
Updating	: setools-libs-3.3.8-4.el7.x86_64	9/24
Updating	: policycoreutils-python-2.5-34.el7.x86_64	10/24
Updating	: 2:container-selinux-2.119.2-1.911c772.el7_8.noarch	11/24
Cleanup	: 2:container-selinux-2.42-1.gitad8f0f7.el7.noarch	12/24
Cleanup	: selinux-policy-targeted-3.13.1-192.el7.noarch	13/24
Cleanup	: policycoreutils-python-2.5-22.el7.x86_64	14/24
Cleanup	: selinux-policy-3.13.1-192.el7.noarch	15/24
Cleanup	: policycoreutils-2.5-22.el7.x86_64	16/24
Cleanup	: libselinux-utils-2.5-12.el7.x86_64	17/24
Cleanup	: setools-libs-3.3.8-2.el7.x86_64	18/24
Cleanup	: libselinux-python-2.5-12.el7.x86_64	19/24
Cleanup	: libsemanage-python-2.5-11.el7.x86_64	20/24
Cleanup	: libsemanage-2.5-11.el7.x86_64	21/24
Cleanup	: libselinux-2.5-12.el7.x86_64	22/24
Cleanup	: libsepol-2.5-8.1.el7.x86_64	23/24
		24/24
rhel-7-server-rpms/7Server/x86_64/productid		
		2.1 kB 00:00:00
Verifying	: libselinux-2.5-15.el7.x86_64	1/24
Verifying	: 2:container-selinux-2.119.2-1.911c772.el7_8.noarch	2/24
Verifying	: selinux-policy-3.13.1-268.el7_9.2.noarch	3/24
Verifying	: selinux-policy-targeted-3.13.1-268.el7_9.2.noarch	4/24
Verifying	: policycoreutils-2.5-34.el7.x86_64	5/24
Verifying	: libselinux-utils-2.5-15.el7.x86_64	6/24
Verifying	: policycoreutils-python-2.5-34.el7.x86_64	7/24
Verifying	: libsemanage-python-2.5-14.el7.x86_64	8/24
Verifying	: libsemanage-2.5-14.el7.x86_64	9/24
Verifying	: libselinux-python-2.5-15.el7.x86_64	10/24
Verifying	: libsepol-2.5-10.el7.x86_64	11/24
Verifying	: setools-libs-3.3.8-4.el7.x86_64	12/24
Verifying	: libsemanage-python-2.5-11.el7.x86_64	

```

Verifyng   : libsemanage-2.5-11.el7.x86_64                               13/24
Verifyng   : libselinux-python-2.5-12.el7.x86_64                       14/24
Verifyng   : setools-libs-3.3.8-2.el7.x86_64                           15/24
Verifyng   : policycoreutils-2.5-22.el7.x86_64                         16/24
Verifyng   : 2:container-selinux-2.42-1.gitad8f0f7.el7.noarch           17/24
Verifyng   : policycoreutils-python-2.5-22.el7.x86_64                  18/24
Verifyng   : selinux-policy-targeted-3.13.1-192.el7.noarch             19/24
Verifyng   : libsepol-2.5-8.1.el7.x86_64                               20/24
Verifyng   : selinux-policy-3.13.1-192.el7.noarch                       21/24
Verifyng   : libselinux-2.5-12.el7.x86_64                              22/24
Verifyng   : libselinux-utils-2.5-12.el7.x86_64                       23/24
Verifyng   : libselinux-utils-2.5-12.el7.x86_64                       24/24

```

Updated:

```
container-selinux.noarch 2:2.119.2-1.911c772.el7_8
```

Dependency Updated:

```

libselinux.x86_64 0:2.5-15.el7                               libselinux-python.x86_64 0:2.5-15.el7
libselinux-utils.x86_64 0:2.5-15.el7                       libsemanage.x86_64 0:2.5-14.el7
libsemanage-python.x86_64 0:2.5-14.el7                     libsepol.x86_64 0:2.5-10.el7
policycoreutils.x86_64 0:2.5-34.el7                       policycoreutils-python.x86_64 0:2.5-34.el7
selinux-policy.noarch 0:3.13.1-268.el7_9.2                 selinux-policy-targeted.noarch 0:3.13.1-268.el7_9.2
setools-libs.x86_64 0:3.3.8-4.el7

```

Complete!

```
[root@fnd451testupgrade ~]#
```

Enabling Selinux with Enforce Mode:

From IoT FND 5.0 release onwards, the Mandatory Access Controls (MAC) system such as selinux should be pre-installed, if an operating system is capable of using a MAC.

1. Check the selinux status by using the command **sestatus**.
2. Install selinux using the necessary packages, if selinux is not installed already.

For CentOS/RHEL OS version:

```
sudo yum install selinux-policy selinux-policy-targeted
```

3. Edit to set the selinux configuration file to enforcing mode.

```
sed -i 's/^SELINUX=.*$/SELINUX=enforcing/' /etc/selinux/config
```

4. Reboot the virtual machine to apply the changes.

```
sudo reboot
```

5. Ensure the selinux is enabled and in enforcing mode after rebooting the virtual machine by using the command **sestatus**.

- b) **Method 2 — Manual Upgrade:** If the IoT FND server is offline, that has no internet connection because of security reasons, then you have to upgrade the container-selinux and the dependent packages manually by downloading them from the CentOS Mirror website. Download the 11 dependent packages and install them.

Run the following command to install the dependent packages in the same sequence listed in the [Table 2: The dependent packages below apply only for container-selinux-2.107-3.el7.noarch.rpm.](#)

```
rpm -Uvh package-name
```

Note Minimum required version of the container-selinux package is container-selinux-2.107-3.el7.noarch.rpm.

Note If the version of the container-selinux is higher, then the dependent rpm packages that are required is also higher. Refer to the CentOS Mirror website on the version requirements of the dependent packages.

Table 2: The dependent packages below apply only for container-selinux-2.107-3.el7.noarch.rpm.

Container-Selinux — Dependent Packages
libsepol-2.5-10.el7.x86_64.rpm
libselenium-2.5-15.el7.x86_64.rpm
libsemanage-2.5-14.el7.x86_64.rpm
libselenium-utils-2.5-15.el7.x86_64.rpm
policycoreutils-2.5-34.el7.x86_64.rpm
selinux-policy-3.13.1-268.el7_9.2.noarch.rpm
selinux-policy-targeted-3.13.1-268.el7_9.2.noarch.rpm
libsemanage-python-2.5-14.el7.x86_64.rpm
libselenium-python-2.5-15.el7.x86_64.rpm
setools-libs-3.3.8-4.el7.x86_64.rpm
policycoreutils-python-2.5-34.el7.x86_64.rpm

Step 3 Extract the `cgms rpms` files to the IoT FND server.

Based on the OS that you are using, you can extract the scripts (in ZIP format) as follows:

- For Windows—Extract the upgrade scripts on PC and then transfer to the IoT FND server.
- For extracting the upgrade scripts directly on IoT FND server or Linux—Run the following commands:

```
[root@iot-fnd opt]# ls
cgms-influx cgms-postgres CISCO-IOTFND-VPI-K9-UPGRADE-SCRIPTS-4.7.0-101.zip containerd
fnd fogd monitor rh scripts
[root@iot-fnd opt]#
[root@iot-fnd opt]# rpm -qa | grep unzip
unzip-6.0-20.el7.x86_64
[root@iot-fnd opt]#
[root@iot-fnd opt]# unzip CISCO-IOTFND-VPI-K9-UPGRADE-SCRIPTS-4.7.0-101.zip
Archive:  CISCO-IOTFND-VPI-K9-UPGRADE-SCRIPTS-4.7.0-101.zip
  inflating: upgrade-ova-4.7.0-101.rpm
[root@iot-fnd opt]#
```

```
[root@iot-fnd opt]# ls
cgms-influx cgms-postgres CISCO-IOTFND-VPI-K9-UPGRADE-SCRIPTS-4.7.0-101.zip containerd
fnd fogd monitor rh scripts upgrade-ova-4.7.0-101.rpm
[root@iot-fnd opt]#
```

For example, if you are upgrading the DB and the docker server image for IoT FND release 4.7.0.

- a) Download the following upgrade script from Cisco.

CISCO-IOTFND-VPI-K9-UPGRADE-SCRIPTS-4.7.0-101.zip

- b) Extract the file to get the rpm:

upgrade-ova-4.7.0-101.rpm

- c) Transfer the extracted rpm file to the IoT FND server.

You can copy the rpm file to any directory. In this example, the file is copied to /opt.

Step 4 Go to the directory where you have copied the rpm file.

For example, `cd /opt` or any directory where the *upgrade-ova-4.7.0-101.rpm* file is copied.

Step 5 Run the the following upgrade script.

```
rpm -Uvh upgrade-ova-<release>-<build number>.rpm
```

For example, `rpm -Uvh upgrade-ova-4.7.2-8.rpm`.

The upgrade script automatically integrates the DB with IoT FND scripts (Postgres with Influx DB) and upgrades the docker server image.

Note You can find the install log information in `/root/rpm.log`.

Sample log information for the rpm upgrade script:

```
root@iot-fnd:/opt[root@iot-fnd opt]# rpm -Uvh upgrade-ova-4.7.2-8.rpm
Preparing...
(1%)#####(100%)

Updating / installing...
 1:upgrade-ova-4.7.2-8
  (1%)#####(100%)

Started installer in background. Please check ~/rpm.log in few minutes for details.
root@iot-fnd:/optYou have new mail in /var/spool/mail/root
[root@iot-fnd opt]#
Mon May  9 01:59:29 PDT 2022 Background installer started
Mon May  9 01:59:29 PDT 2022 Please wait until the 'RPM installation completed' message is logged

Mon May  9 01:59:29 PDT 2022 Upgrading cgms-postgres-4.7.2-8.x86_64.rpm
Preparing... #####
Updating / installing...
cgms-postgres-4.7.2-8 #####
Cleaning up / removing...
cgms-postgres-4.7.0-101 #####

Mon May  9 01:59:47 PDT 2022 Upgrading cgms-influx-4.7.2-8.x86_64.rpm
Preparing... #####
Updating / installing...
cgms-influx-4.7.2-8 #####
Cleaning up / removing...
cgms-influx-4.7.0-101 #####
```

```

Mon May 9 02:00:04 PDT 2022 Upgrading monit-5.25.3-1.el7.x86_64.rpm
warning: monit-5.25.3-1.el7.x86_64.rpm: Header V4 RSA/SHA1 Signature, key ID 222b0e83: NOKEY
Preparing... #####
package monit-5.25.3-1.el7.x86_64 is already installed

Mon May 9 02:00:18 PDT 2022 Stopping services
Mon May 9 02:00:58 PDT 2022 Upgrading Postgresql to 12.5
Preparing... #####
Updating / installing...
postgresql12-libs-12.5-1PGDG.rhel7 #####
postgresql12-12.5-1PGDG.rhel7 #####
postgresql12-server-12.5-1PGDG.rhel7 #####
postgresql12-contrib-12.5-1PGDG.rhel7 #####
Cleaning up / removing...
postgresql12-contrib-12.4-1PGDG.rhel7 #####
postgresql12-server-12.4-1PGDG.rhel7 #####
postgresql12-12.4-1PGDG.rhel7 #####
postgresql12-libs-12.4-1PGDG.rhel7 #####
Mon May 9 02:01:27 PDT 2022 Restarting Postgresql

Mon May 9 02:01:40 PDT 2022 Stopping InfluxDB and Kapacitor
Mon May 9 02:01:50 PDT 2022 Upgrading influxdb-1.8.3.x86_64.rpm
Preparing... #####
Updating / installing...
influxdb-1.8.3-1 warning: /etc/influxdb/influxdb.conf created as
/etc/influxdb/influxdb.conf.rpmnew
#####
Cleaning up / removing...
influxdb-1.5.3-1 #####
Mon May 9 02:02:02 PDT 2022 Upgrading kapacitor-1.5.7-1.x86_64.rpm
Preparing... #####
Updating / installing...
kapacitor-1.5.7-1 warning: /etc/kapacitor/kapacitor.conf created as
/etc/kapacitor/kapacitor.conf.rpmnew
#####
Cleaning up / removing...
kapacitor-1.5.0-1 #####
Mon May 9 02:02:06 PDT 2022 Restarting InfluxDB and Kapacitor

Mon May 9 02:02:20 PDT 2022 Stopping Docker
Mon May 9 02:02:26 PDT 2022 Upgrading Docker to 19.03.15
warning: container-selinux-2.119.2-1.911c772.el7_8.noarch.rpm: Header V3 RSA/SHA256 Signature, key
ID f4a80eb5: NOKEY
Preparing...
(1%)#####(100%)
Updating / installing...
1:container-selinux-2:2.119.2-1.911
(1%)#####(100%)
Cleaning up / removing...
2:container-selinux-2:2.42-1.gitad8
(1%)#####(100%)
Preparing...
(1%)#####(100%)

Updating / installing...
1:docker-ce-cli-1:19.03.15-3.el7
(1%)#####(100%)
2:containerd.io-1.4.4-3.1.el7
(1%)#####(100%)
3:docker-ce-3:19.03.15-3.el7
(1%)#####(100%)
/usr/bin/dockerd has not been configured as an alternative for dockerd
Cleaning up / removing...

```

```

4:docker-ce-3:18.09.6-3.e17
(1%)#####(100%)
5:containerd.io-1.2.5-3.1.e17
(1%)#####(100%)
6:docker-ce-cli-1:18.09.6-3.e17
(1%)#####(100%)
Mon May  9 02:04:11 PDT 2022 Restarting Docker
Mon May  9 02:04:29 PDT 2022 Restarting services
Mon May  9 02:04:59 PDT 2022 RPM installation completed

```

Example

Manual Upgrade of IoT FND 4.5.1 to Later Versions—Use this upgrade procedure ONLY if you want to upgrade on your own without using Cisco rpm (*upgrade-ova-4.7.0-101.rpm*) that is provided to you:

1. Extract the rpm scripts by running the following command:

```

rpm2cpio upgrade-ova-4.7.0-101.rpm | cpio -idmv

[root@iot-fnd opt]# rpm2cpio upgrade-ova-4.7.0-101.rpm | cpio -idmv
./upgrade-ova-4.7.0-101
./upgrade-ova-4.7.0-101/Application-Watchdog
./upgrade-ova-4.7.0-101/Application-Watchdog/README.md
./upgrade-ova-4.7.0-101/Application-Watchdog/monitor-args.ini
./upgrade-ova-4.7.0-101/Application-Watchdog/monitor.sh
./upgrade-ova-4.7.0-101/Application-Watchdog/monitor_app_health.py
./upgrade-ova-4.7.0-101/Application-Watchdog/plugin_categories.py
./upgrade-ova-4.7.0-101/Application-Watchdog/plugins
./upgrade-ova-4.7.0-101/Application-Watchdog/plugins/container_registration.py
./upgrade-ova-4.7.0-101/Application-Watchdog/plugins/container_registration.yapsy-plugin
./upgrade-ova-4.7.0-101/Application-Watchdog/plugins/container_stats_collection.py
./upgrade-ova-4.7.0-101/Application-Watchdog/plugins/container_stats_collection.yapsy-plugin
./upgrade-ova-4.7.0-101/Application-Watchdog/postgres-vacuum.sh
./upgrade-ova-4.7.0-101/Application-Watchdog/setup.sh
./upgrade-ova-4.7.0-101/Continuous-Integration
./upgrade-ova-4.7.0-101/Continuous-Integration/README.md
./upgrade-ova-4.7.0-101/Continuous-Integration/fnd
./upgrade-ova-4.7.0-101/Continuous-Integration/fnd/conf
./upgrade-ova-4.7.0-101/Continuous-Integration/fnd/conf/fnd-env.list
./upgrade-ova-4.7.0-101/Continuous-Integration/fnd/data
./upgrade-ova-4.7.0-101/Continuous-Integration/fnd/data/cgms_keystore.selfsigned
./upgrade-ova-4.7.0-101/Continuous-Integration/fnd/data/cisco-sudi-ca.pem
./upgrade-ova-4.7.0-101/Continuous-Integration/fnd/data/userPropertyTypes.xml
./upgrade-ova-4.7.0-101/Continuous-Integration/fnd/logs
./upgrade-ova-4.7.0-101/Continuous-Integration/fnd/scripts
./upgrade-ova-4.7.0-101/Continuous-Integration/fnd/scripts/fnd-container.sh
./upgrade-ova-4.7.0-101/Continuous-Integration/fnd/scripts/fnd-task
./upgrade-ova-4.7.0-101/Continuous-Integration/fnd/scripts/setup-IPv6-network.sh
./upgrade-ova-4.7.0-101/Continuous-Integration/fnd/scripts/upgrade.sh
./upgrade-ova-4.7.0-101/Continuous-Integration/fogd
./upgrade-ova-4.7.0-101/Continuous-Integration/fogd/conf
./upgrade-ova-4.7.0-101/Continuous-Integration/fogd/conf/fogd-env.list
./upgrade-ova-4.7.0-101/Continuous-Integration/fogd/scripts
./upgrade-ova-4.7.0-101/Continuous-Integration/fogd/scripts/fogd-container.sh
./upgrade-ova-4.7.0-101/Continuous-Integration/fogd/scripts/fogd-info.sh
./upgrade-ova-4.7.0-101/Continuous-Integration/fogd/scripts/fogd-stats.sh
./upgrade-ova-4.7.0-101/Continuous-Integration/fogd/scripts/fogd-task
./upgrade-ova-4.7.0-101/Continuous-Integration/scripts
./upgrade-ova-4.7.0-101/Continuous-Integration/scripts/status.sh
./upgrade-ova-4.7.0-101/Continuous-Integration/upgrade-ova.spec

```

```

./upgrade-ova-4.7.0-101/Continuous-Integration/watchdog
./upgrade-ova-4.7.0-101/Continuous-Integration/watchdog/field-network-director.conf
./upgrade-ova-4.7.0-101/Continuous-Integration/watchdog/field-network-director.sh
./upgrade-ova-4.7.0-101/Continuous-Integration/watchdog/fog-director.conf
./upgrade-ova-4.7.0-101/Continuous-Integration/watchdog/fog-director.sh
./upgrade-ova-4.7.0-101/Continuous-Integration/watchdog/influxdb.conf
./upgrade-ova-4.7.0-101/Continuous-Integration/watchdog/kapacitor.conf
./upgrade-ova-4.7.0-101/Continuous-Integration/watchdog/postgresql.conf
./upgrade-ova-4.7.0-101/rpms
./upgrade-ova-4.7.0-101/rpms/cgms-influx-4.7.0-101.x86_64.rpm
./upgrade-ova-4.7.0-101/rpms/cgms-postgres-4.7.0-101.x86_64.rpm
./upgrade-ova-4.7.0-101/rpms/delay-installer.sh
./upgrade-ova-4.7.0-101/rpms/migrate-postgres.sh
./upgrade-ova-4.7.0-101/rpms/monit-5.25.3-1.el7.x86_64.rpm
./upgrade-ova-4.7.0-101/rpms/postgresql12-12.4-1PGDG.rhel7.x86_64.rpm
./upgrade-ova-4.7.0-101/rpms/postgresql12-contrib-12.4-1PGDG.rhel7.x86_64.rpm
./upgrade-ova-4.7.0-101/rpms/postgresql12-libs-12.4-1PGDG.rhel7.x86_64.rpm
./upgrade-ova-4.7.0-101/rpms/postgresql12-server-12.4-1PGDG.rhel7.x86_64.rpm
./upgrade-ova-4.7.0-101/Application-Watchdog/monitor_app_health.py
cpio: ./upgrade-ova-4.7.0-101/Application-Watchdog/monitor_app_health.pyo linked to
./upgrade-ova-4.7.0-101/Application-Watchdog/monitor_app_health.pyc
./upgrade-ova-4.7.0-101/Application-Watchdog/monitor_app_health.pyo
./upgrade-ova-4.7.0-101/Application-Watchdog/plugin_categories.pyc
cpio: ./upgrade-ova-4.7.0-101/Application-Watchdog/plugin_categories.pyo linked to
./upgrade-ova-4.7.0-101/Application-Watchdog/plugin_categories.pyc
./upgrade-ova-4.7.0-101/Application-Watchdog/plugin_categories.pyo
./upgrade-ova-4.7.0-101/Application-Watchdog/plugins/container_registration.pyc
cpio: ./upgrade-ova-4.7.0-101/Application-Watchdog/plugins/container_registration.pyo
linked to ./upgrade-ova-4.7.0-101/Application-Watchdog/plugins/container_registration.pyc
./upgrade-ova-4.7.0-101/Application-Watchdog/plugins/container_registration.pyo
./upgrade-ova-4.7.0-101/Application-Watchdog/plugins/container_stats_collection.pyc
cpio: ./upgrade-ova-4.7.0-101/Application-Watchdog/plugins/container_stats_collection.pyo
linked to
./upgrade-ova-4.7.0-101/Application-Watchdog/plugins/container_stats_collection.pyc
./upgrade-ova-4.7.0-101/Application-Watchdog/plugins/container_stats_collection.pyo
189297 blocks
[root@iot-fnd opt]#
[root@iot-fnd opt]#
[root@iot-fnd opt]# ls
cgms-influx cgms-postgres containerd fnd fogd monitor rh scripts
upgrade-ova-4.7.0-101 upgrade-ova-4.7.0-101.rpm
[root@iot-fnd opt]#
[root@iot-fnd opt]#
[root@iot-fnd opt]# cd upgrade-ova-4.7.0-101
[root@iot-fnd upgrade-ova-4.7.0-101]# ls
Application-Watchdog Continuous-Integration rpms
[root@iot-fnd upgrade-ova-4.7.0-101]#
[root@iot-fnd upgrade-ova-4.7.0-101]#
[root@iot-fnd upgrade-ova-4.7.0-101]# cd rpms
[root@iot-fnd rpms]#
[root@iot-fnd rpms]# ls
cgms-influx-4.7.0-101.x86_64.rpm migrate-postgres.sh
postgresql12-contrib-12.4-1PGDG.rhel7.x86_64.rpm
cgms-postgres-4.7.0-101.x86_64.rpm monit-5.25.3-1.el7.x86_64.rpm
postgresql12-libs-12.4-1PGDG.rhel7.x86_64.rpm
delay-installer.sh postgresql12-12.4-1PGDG.rhel7.x86_64.rpm
postgresql12-server-12.4-1PGDG.rhel7.x86_64.rpm
[root@iot-fnd rpms]#

```

2. Run the following script.

```
/opt/fnd/scripts/upgrade.sh
```

3. Select options 3 and 4 in a sequence to integrate the DB with IoT FND scripts (Postgres and Influx) as shown in the log information:

```
[root@iot-fnd rpms]# /opt/fnd/scripts/upgrade.sh
This script must be run with root privileges.
Usage: Load container images: No resource required
       For container reload: No resource required
       For FND Postgres RPM upgrade: Requires <path to cgms-postgres.rpm>
       FND Influx RPM upgrade: Requires <path to cgms-influx.rpm>

1) Load container images      4) FND Influx RPM upgrade
2) Container reload           5) Quit
3) FND Postgres RPM upgrade
Enter your choice: 3
Enter cgms-postgres rpm file path: cgms-postgres-4.7.0-101.x86_64.rpm
Stopping FND container...
fnd-container
Preparing...
Updating / installing...
  1:cgms-postgres-4.7.0-101
Cleaning up / removing...
  2:cgms-postgres-4.5.1-11
Starting FND container...
Enter your choice: fnd-container
^C
[root@iot-fnd rpms]# pwd
/opt/upgrade-ova-4.7.0-101/rpms
[root@iot-fnd rpms]# /opt/fnd/scripts/fnd-container.sh status
fnd-container is running, pid=37806
CONTAINER ID      NAME      CPU %      MEM USAGE / LIMIT      MEM %
NET I/O          BLOCK I/O  PIDS
61921642276c     fnd-container  2.41%     2.764GiB / 23.38GiB    11.82%
11.3MB / 9.84MB  0B / 2.33MB  315

[root@iot-fnd rpms]#
[root@iot-fnd rpms]# /opt/fnd/scripts/upgrade.sh
This script must be run with root privileges.
Usage: Load container images: No resource required
       For container reload: No resource required
       For FND Postgres RPM upgrade: Requires <path to cgms-postgres.rpm>
       FND Influx RPM upgrade: Requires <path to cgms-influx.rpm>

1) Load container images      4) FND Influx RPM upgrade
2) Container reload           5) Quit
3) FND Postgres RPM upgrade
Enter your choice: 4
Enter cgms-influx rpm file path: cgms-influx-4.7.0-101.x86_64.rpm
Stopping FND container...
fnd-container
Preparing...
Updating / installing...
  1:cgms-influx-4.7.0-101
Cleaning up / removing...
  2:cgms-influx-4.5.1-11
Starting FND container...
Enter your choice: fnd-container
^C
[root@iot-fnd rpms]#
[root@iot-fnd rpms]# /opt/fnd/scripts/fnd-container.sh status
fnd-container is running, pid=45404
CONTAINER ID      NAME      CPU %      MEM USAGE / LIMIT      MEM %
NET I/O          BLOCK I/O  PIDS
61921642276c     fnd-container  2.44%     2.095GiB / 23.38GiB    8.96%
11.3MB / 9.84MB  0B / 2.45MB  315

[root@iot-fnd rpms]#
```




Note The options 3 and 4 present in the script, `./upgrade.sh`, ONLY install the database integration scripts and they do not upgrade the entire DB.

4. To upgrade the entire DB, contact your DB Administrator or visit <https://www.postgresql.org/docs/current/upgrading.html> to upgrade the Postgres.
5. Install the docker server image from <https://docs.docker.com/engine/install/rhel/>.

What to do next

[Upgrading IoT FND and FD Container Images, on page 17](#)

Upgrading IoT FND and FD Container Images

Before you begin

- [Pre-Upgrade Checklist, on page 1](#)
- [Upgrading the Database and Docker Server Image, on page 5](#)

Step 1

Run the following script:

```
/opt/fnd/scripts/upgrade.sh
```

```
[root@iot-fnd ~]# /opt/fnd/scripts/upgrade.sh
```

This script must be run with root privileges.

Usage: Load container images: No resource required

For container reload: No resource required

```
1) Load container images
```

```
2) Container reload
```

```
3) Quit
```

```
Enter your choice: 1
```

```
Do you want to download docker image from registry (y/n)?y
```

```
Enter docker registry [devhub-docker.cisco.com]: dockerhub.cisco.com
```

```
Enter docker image tag: 4.7.2-8
```

```
Downloading FND docker image...
```

```
4.7.2-8: Pulling from field-network-director-dev-docker/fnd-image
```

```
42ae914c6f41: Pull complete
```

```
ea3c714182eb: Pull complete
```

```
177abefb5b93: Pull complete
```

```
e696bdc28724: Pull complete
```

```
89dd87262f50: Pull complete
```

```
ff6164c0609f: Pull complete
```

```
89a0b2205b62: Pull complete
```

```
4dbd23bb6e45: Pull complete
```

```
Digest: sha256:2ae8a3cba38ea28156a2c3db55cd8cea0448888a7704479cac33b665d8b2a132
```

```
Status: Downloaded newer image for
```

```
dockerhub.cisco.com/field-network-director-dev-docker/fnd-image:4.7.2-8
```

```
dockerhub.cisco.com/field-network-director-dev-docker/fnd-image:4.7.2-8
```

```
Downloading Fog Director docker image...
```

```
4.7.2-8: Pulling from fog-director-dev-docker/fogd-image
```

```

5e9a6732a7a3: Pull complete
55a104320bff: Pull complete
506e5a93cf62: Pull complete
9b2523a38071: Pull complete
8e8389537d47: Pull complete
e6fcef979884: Pull complete
e2e278b80221: Pull complete
63bc79650477: Pull complete
Digest: sha256:16f3227fbac74804f1e2a77aa57ebbeb5b9f05eb4efb0ddccf242865fe673634
Status: Downloaded newer image for dockerhub.cisco.com/fog-director-dev-docker/fogd-image:4.7.2-8
dockerhub.cisco.com/fog-director-dev-docker/fogd-image:4.7.2-8

```

```

1) Load container images
2) Container reload
3) Quit
Enter your choice: 2
Stopping FND container...
fnd-container
Remove FND container...
fnd-container
Prune Docker container...
Starting FND container...
a02e6388607d79504f082dccf179514e5dc2d6bcd34021beac21baf1a555c266
Stopping Fog Director container...
fogd-container
Remove Fog Director container...
fogd-container
Prune Docker container...
Starting Fog Director container...
a40aa29e2392e1e99a5f024d3d5838712d66ef638f0c6b0bf209b1932076611c

```

```

1) Load container images
2) Container reload
3) Quit
Enter your choice: 3
You have new mail in /var/spool/mail/root
[root@iot-fnd ~]#

```

Step 2 Enter **1** to load container images.

```

[root@iot-fnd ~]# /opt/fnd/scripts/upgrade.sh

This script must be run with root privileges.
Usage: Load container images: No resource required
       For container reload: No resource required

1) Load container images
2) Container reload
3) Quit
Enter your choice: 1

```

Step 3 Download the container image for IoT FND from devhub-docker.cisco.com.

Note You need valid CCO credentials to log into Cisco external docker registry.

Step 4 After the images are downloaded successfully, enter **2** to reload container.

IoT FND upgrade is complete.

```
1) Load container images
2) Container reload
3) Quit
Enter your choice: 2
Stopping FND container...
fnd-container
Remove FND container...
fnd-container
Prune Docker container...
Starting FND container...
3da4837b448548c06e0ee2eac75696231462a2bba480bfa6a75358812095da60
Stopping Fog Director container...
fogd-container
Remove Fog Director container...
fogd-container
Remove FND container...
fnd-container
Prune Docker container...
Starting FND container...
3da4837b448548c06e0ee2eac75696231462a2bba480bfa6a75358812095da60
Stopping Fog Director container...
fogd-container
Remove Fog Director container...
fogd-container
Prune Docker container...
Starting Fog Director container...
6b6fdbb4810bb8cb471e16717a9a3adbc4b3a9f666e5a423e62c7d57014c8c5c
1) Load container images
2) Container reload
3) Quit
Enter your choice: 3
You have new mail in /var/spool/mail/root
```

Enter **3** to Quit the menu.

What to do next

[Post-Upgrade Checklist, on page 20](#)

Post-Upgrade Checklist



Attention From IoT FND 4.12 onwards, use the following credentials for SSH access after upgrading OVA. The existing credentials username/password (root/cisco123) is disabled for 4.12 and later releases:

- Username: fnduser
- Password: C!sco123

See [Guidelines](#) for resetting password.

Step 1 Restart Postgres service if the current IoT FND release is prior to 4.9.1 and the target IoT FND release is 4.9.1 or above.

Step 2 Check the DB and IoT FND status by running the following commands:

- `/opt/scripts/status.sh`
- `docker version`
- `/opt/fnd/scripts/fnd-container.sh status`
- `docker exec -it fnd-container /etc/init.d/cgms status`

Note On completion of the upgrade process, restart the IoT FND container after replacing the files from backup to their original location.

```

Login to the FND container
[root@iot-fnd ~]# docker exec -it fnd-container /bin/bash
[root@fnd-server /]#
[root@fnd-server /]# cp /opt/cgms/server/cgms/conf/jbossas.keystore.password.bkpl
/opt/cgms/server/cgms/conf/jbossas.keystore.password
[root@fnd-server /]# cp /opt/cgms/server/cgms/conf/jbossas.keystore.bkpl
/opt/cgms/server/cgms/conf/jbossas.keystore
[root@fnd-server /]# cp /opt/cgms/server/cgms/conf/vault.keystore.bkpl
/opt/cgms/server/cgms/conf/vault.keystore
[root@fnd-server /]# cp /opt/cgms/server/cgms/conf/VAULT.dat.bkpl
/opt/cgms/server/cgms/conf/VAULT.dat
[root@fnd-server /]# cp /opt/cgms/server/cgms/deploy/security-service.xml.bkpl
/opt/cgms/server/cgms/deploy/security-service.xml
[root@fnd-server /]# exit
[root@fnd ~]# /opt/fnd/scripts/fnd-container.sh stop
[root@fnd ~]# /opt/fnd/scripts/fnd-container.sh start

```

Step 3 Log into IoT FND to check if the services are working fine.

For example, you can refresh the metrics for a couple of devices or add/delete devices using CSV.

Upgrading IoT FND from 4.5.1 to later releases and Updating RHEL OS



Note This procedure is applicable only when you want to upgrade IOT FND version from FND 4.5.1 to FND 4.9.x along with RHEL base OS upgrade.

Step 1 Download the latest 4.5.1-11 upgrade zip from [Cisco Download](#) page.

CISCO-IOTFND-VPI-K9-UPGRADE-SCRIPTS-4.5.1-11.zip

Step 2 Extract the file to get the rpm.

Step 3 Install the upgrade rpm using the following command.

```
rpm -ivh upgrade-ova-4.5.1-11.rpm
```

Step 4 Run the `./upgrade.sh` script in `/opt/fnd/scripts` directory.

Note You can skip the FND postgres rpm and FND influx upgrade rpm.

Step 5 To upgrade IoT FND from 4.5.1-11 to 4.7.2-8, download the latest 4.7.2-8 upgrade rpm from the [Cisco Download](#) page.

Step 6 Upgrade the upgrade-ova-4.7.2- 8.rpm using the following command.

```
rpm -Uvh upgrade-ova-4.7.2-8.rpm
```

Step 7 Run the `./upgrade.sh` script in `/opt/fnd/scripts` directory.

Note IoT FND OVA upgrade will NOT upgrade the RHEL OS version. After upgrading the OVA, it is recommended to upgrade the OS as well.

Step 8 Upgrade base OS from RHEL 7.5 to 7.9.

Step 9 To upgrade from IoT FND 4.7.2-8 to 4.9.x, download the latest 4.9.x upgrade rpm from [Cisco Download](#) page.

Step 10 Upgrade the upgrade-ova-4.9. x.rpm using the following command.

```
rpm -Uvh upgrade-ova-4.9.x.rpm
```

Step 11 Run the `./upgrade.sh` script in `/opt/fnd/scripts` directory.

Step 12 Upgrade base OS from RHEL 7.9 to 8.6.

Step 13 IoT FND 4.9.0 OVA is bundled with Postgres 12.9 rpms of rhel7. In order to upgrade Postgres 12.9 rpms of base OS rhel8 manually:

Note Starting from IoT FND 4.9.1 release, the postgres rpm upgrade is automated.

a) Run the following commands to uninstall the old Postgres (**rhel7**) rpms.

```
rpm -qa | grep postgres
```

```
rpm -e <postgresql12.9xxxx.rhel7.x86_64.rpm>
```

Note Keep the cgms-postgres rpm.

- b) Download all the four Postgres dependent packages from the [YUM](#) link and place the packages in /opt/ directory.

postgresql12-libs-12.9-1PGDG.rhel8.x86_64.rpm

postgresql12-12.9-1PGDG.rhel8.x86_64.rpm

postgresql12-server-12.9-1PGDG.rhel8.x86_64.rpm

postgresql12-contrib-12.9-1PGDG.rhel8.x86_64.rpm

- c) Install all the above rpms in the same sequential order with the following command.

```
rpm -ivh <12.9.1PGDG.rhel8.rpm>
```

- d) Make symlink with below command.

```
chkconfig postgresql-12 on
```

- e) Start the postgres service:

```
service postgresql-12.service start
```

- f) Check if the postgres status is Active (running):

```
service postgresql-12.service status
```

- g) Reload all the required container with FND upgrade script by using 'Option 2) Container Reload'.

- Run the `./upgrade.sh` script in `/opt/fnd/scripts/` directory.
- Enter 2 to reload container.

```
[[root@bgl12-iot-fnd scripts]# cd /opt/fnd/scripts/
[[root@bgl12-iot-fnd scripts]# ./upgrade.sh

This script must be run with root privileges.
Usage: Load container images: No resource required
      For container reload: No resource required

1) Load container images
2) Container reload
3) Quit
Enter your choice: 2
```

- Enter 3 to quit menu.

- h) Run `./status.sh` script in `/opt/scripts/` directory to get the running status of all the required services.

```
[root@bgl12-iot-fnd ~]# cd /opt/scripts/
[root@bgl12-iot-fnd scripts]# ./status.sh
-----
● postgresql-12.service - PostgreSQL 12 database server
   Loaded: loaded (/usr/lib/systemd/system/postgresql-12.service; enabled; vendor preset: disabled)
   Active: active (running) since Mon 2022-10-31 13:27:20 IST; 4 days ago
     Docs: https://www.postgresql.org/docs/12/static/
   Process: 271967 ExecStartPre=/usr/pgsql-12/bin/postgresql-12-check-db-dir ${PGDATA} (code=exited, status=0/SUCCESS)
   Main PID: 271973 (postmaster)
     Tasks: 27 (limit: 152444)
    Memory: 1.2G
-----
● influxdb.service - InfluxDB is an open-source, distributed, time series database
   Loaded: loaded (/usr/lib/systemd/system/influxdb.service; enabled; vendor preset: disabled)
   Active: active (running) since Thu 2022-10-27 12:59:32 IST; 1 weeks 1 days ago
     Docs: https://docs.influxdata.com/influxdb/
   Main PID: 1520 (influxd)
     Tasks: 21 (limit: 152444)
    Memory: 611.5M
-----
● kapacitor.service - Time series data processing engine.
   Loaded: loaded (/usr/lib/systemd/system/kapacitor.service; enabled; vendor preset: disabled)
   Active: active (running) since Thu 2022-10-27 12:59:32 IST; 1 weeks 1 days ago
     Docs: https://github.com/influxdb/kapacitor
   Main PID: 1519 (kapacitord)
     Tasks: 14 (limit: 152444)
    Memory: 59.7M
-----
fnd-container is running, pid=272372
*** WARNING : deprecated key derivation used.
Using -iter or -pbkdf2 would be better.
CONTAINER ID   NAME           CPU %     MEM USAGE / LIMIT   MEM %     NET I/O       BLOCK I/O     PIDS
9b27aeac63fe   fnd-container  1.81%    1.738GiB / 23.32GiB  7.45%    963MB / 943MB  8.19kB / 3.2MB  628
-----
fogd-container is running, pid=274778
*** WARNING : deprecated key derivation used.
Using -iter or -pbkdf2 would be better.
CONTAINER ID   NAME           CPU %     MEM USAGE / LIMIT   MEM %     NET I/O       BLOCK I/O     PIDS
b3d97b27913e   fogd-container  0.51%    804.6MiB / 23.32GiB  3.37%    665MB / 1.23GB  713kB / 8.19kB  91
```

- i) Log into IoT FND UI to check if the services are working fine. For example, you can refresh the metrics for a couple of devices or add/delete devices using CSV.

