

Install and Upgrade Cisco IoT Field Network Director with PostgreSQL

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Introduction

This document describes how to install the Cisco IoT FND PostgreSQL OVA and upgrade from FND Release 5.0.0 to later releases on VMware ESXi.

Prerequisites

VMware ESXi 7.x or later

Cisco IoT Field Network Director (FND) PostgreSQL Open Virtual Appliance (OVA) Release 5.0.0 or later

VM Requirements:

Memory: 24 GB

vCPUs: 4

Disk: 450 GB minimum

Components Used

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

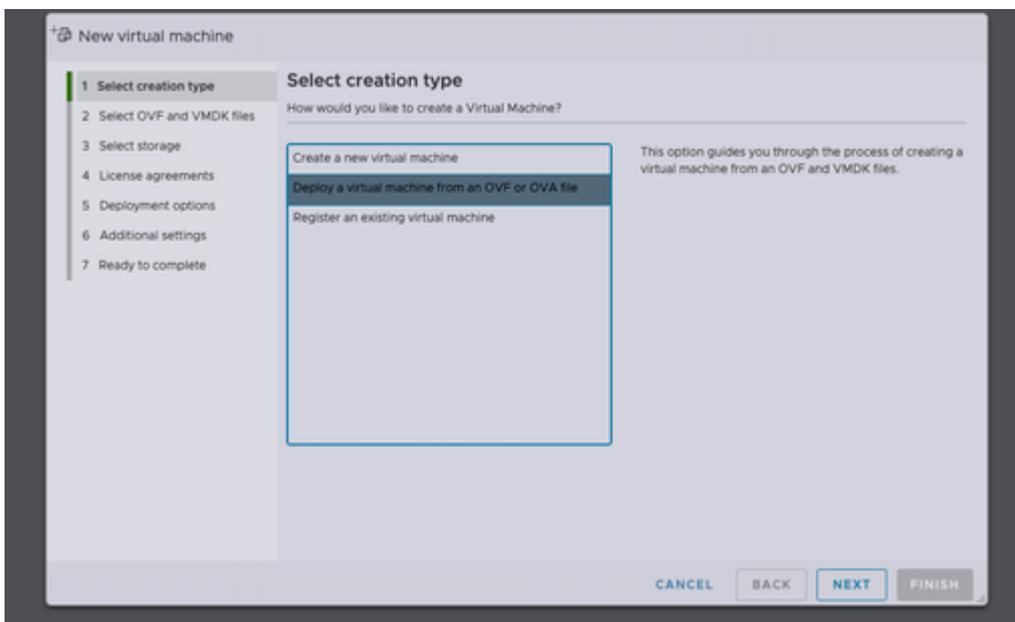
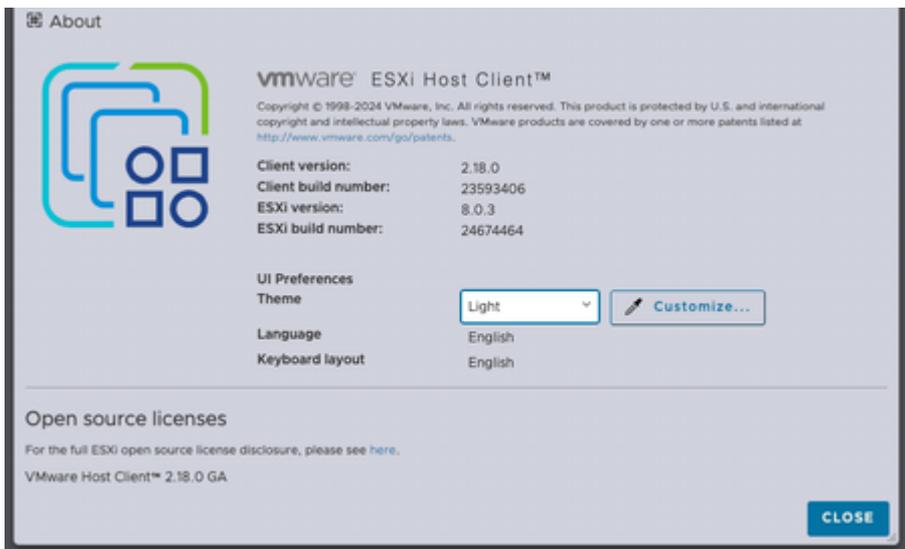
Deploying Cisco IoT FND PostgreSQL OVA

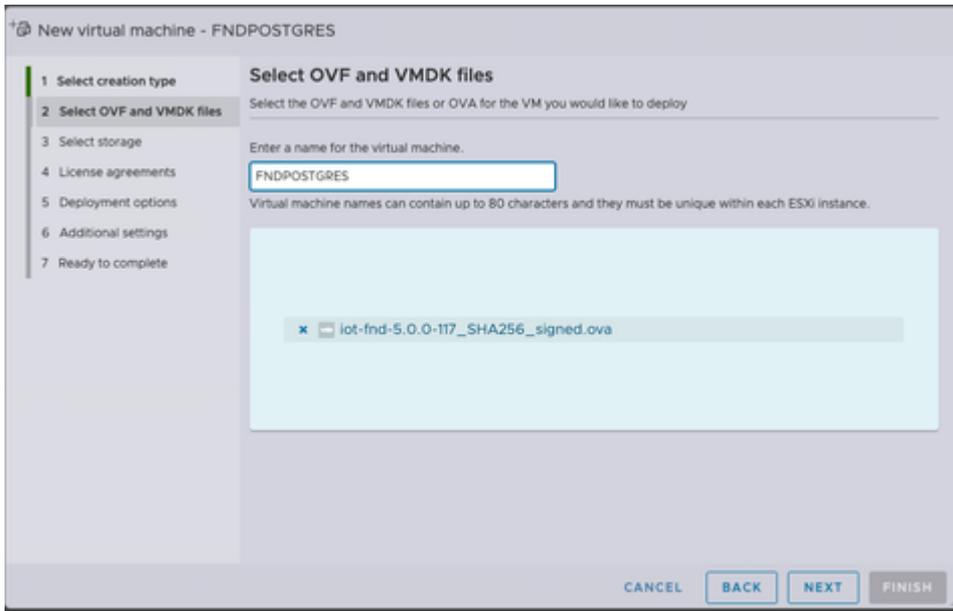
Here are the guidelines to install Cisco IoT FND Release 5.x.x or later releases with an Open Virtual Appliance (OVA) software running VMware ESXi versions 7.x or 8.0 versions.

Step 1: Download the OVA from Cisco Software Downloads

Download the OVA file from the cisco software page - [Click here](#)

Step 2: Login to the VMware vSphere Client to deploy OVA on an ESXi server.





After selecting the data store, select the provisioning type and enable the **Power on automatically** option. This ensures power-on of the virtual machine once the deployment process is complete. Click **Next**.

Notes

Thick Provisioning

- Reserves disk space up front.
- Requires **600 GB** of available disk space on the ESXi server for Cisco IoT FND OVA.

Thin Provisioning

- Disk space grows on demand.
- Initial disk usage is approximately **50 GB**, increasing based on deployment scale.

Review the selections before clicking Finish.



Step 3: Login using Credentials

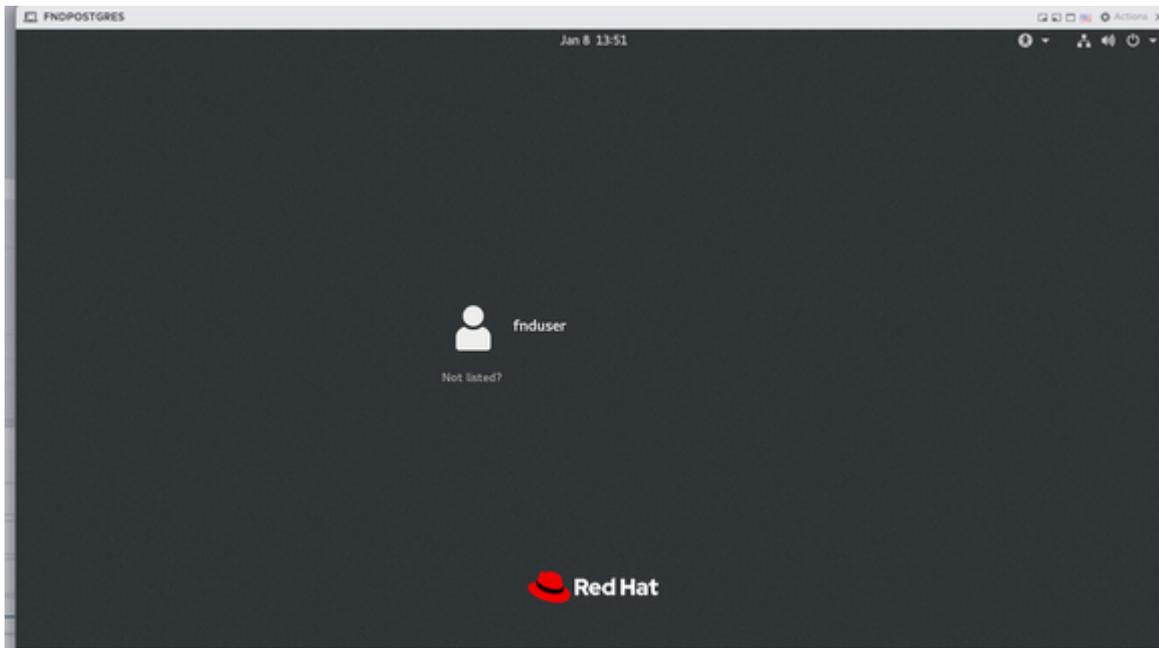
After the OVA deployment completes and the Linux startup screen appears, use these default credentials:

SSH Access

- **Username:** fnduser
- **Password:** C!sco123

GUI Access

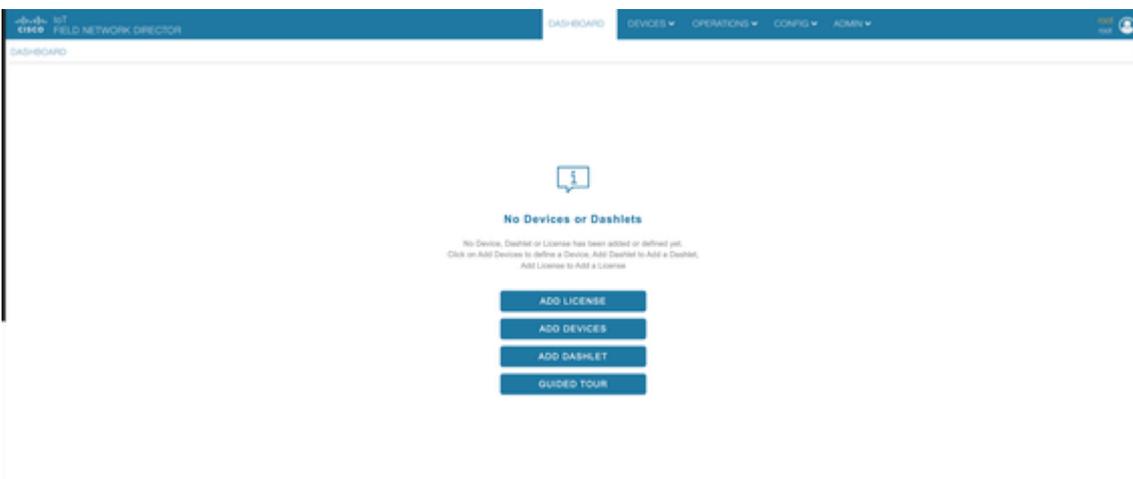
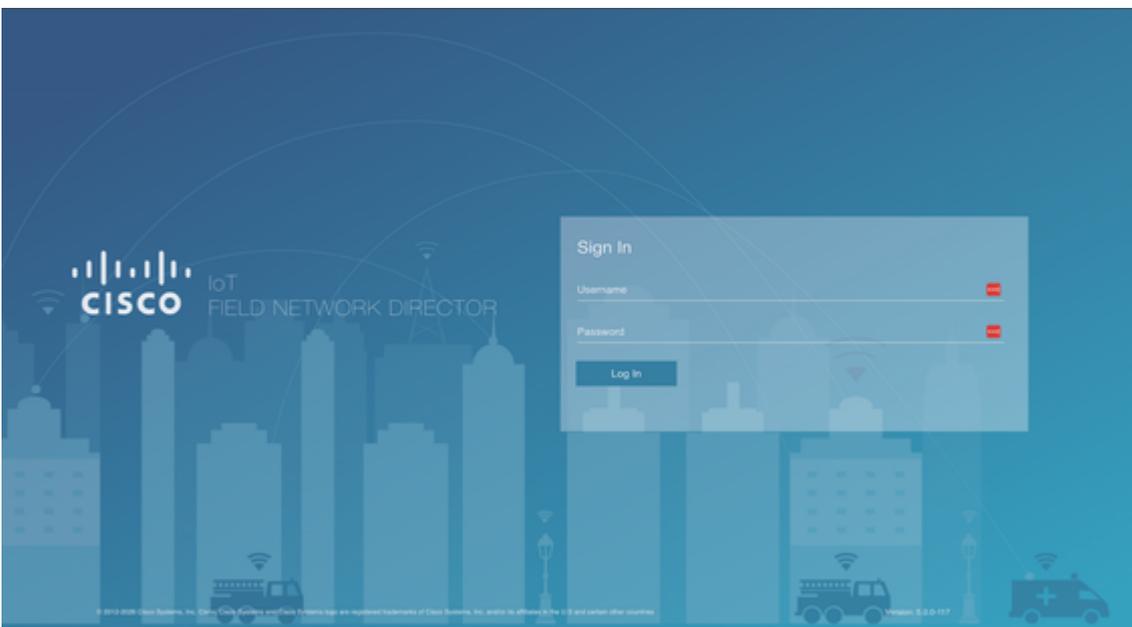
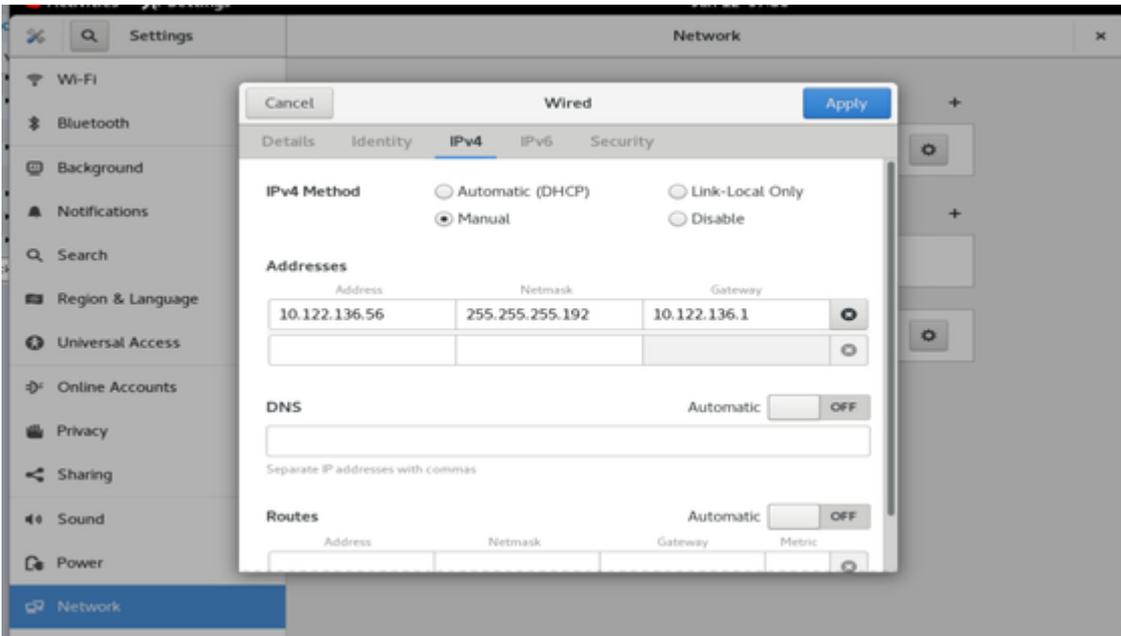
- **Username:** root
- **Password:** root123



Step 4: Network Configuration

Complete the network configuration steps:

1. Assign a static IP address **or** ensure a DHCP server is available to assign an IP address.
2. Configure a valid and reachable DNS server on the host VM.
3. Restart the network services after IP configuration is complete.



Upgrading Cisco IoT FND from Release 5.0 to 5.1

Step 1: Download the Upgrade Package

Download the upgrade package from the Cisco Software Download page - [Click here](#)

Filename: CISCO-IOTFND-VPI-K9-UPGRADE-SCRIPTS-5.1.0-155.zip

Step 2 :Perform Pre-Upgrade Checks

Before proceeding with the upgrade, verify the health and operational status of Cisco IoT FND services.

```
[1]* Stopped ./fnd-container.sh
[root@iot-fnd scripts]# ./fnd-container.sh status
fnd-container is running, pid=2341
*** WARNING : deprecated key derivation used.
Using -iter or -pbkdf2 would be better.
CONTAINER ID        NAME                CPU %               MEM USAGE / LIMIT   MEM %               NET I/O
94f5cac26afa        fnd-container       2.04%               1.822GiB / 23.27GiB  7.83%               21.4MB / 14.4MB
1.2GB / 713kB      645
[root@iot-fnd scripts]# ./fnd-container.sh status
fnd-container is running, pid=2341
*** WARNING : deprecated key derivation used.
Using -iter or -pbkdf2 would be better.
CONTAINER ID        NAME                CPU %               MEM USAGE / LIMIT   MEM %               NET I/O
94f5cac26afa        fnd-container       3.35%               1.822GiB / 23.27GiB  7.83%               21.4MB / 14.4MB
1.2GB / 713kB      645
[root@iot-fnd scripts]#
```

```
[root@iot-fnd opt]#
[root@iot-fnd opt]#
[root@iot-fnd opt]# hostnamectl
Static hostname: iot-fnd
Icon name: computer-vm
Chassis: vm
Machine ID: 211ae1b5f1c74a66ace71dad225e6fffb
Boot ID: 3f5d038fd7044a9c9a4a5db2e080ed81
Virtualization: vmware
Operating System: Red Hat Enterprise Linux 8.10 (Ootpa)
CPE OS Name: cpe:/o:redhat:enterprise_linux:8::baseos
Kernel: Linux 4.18.0-553.8.1.el8_10.x86_64
Architecture: x86-64
[root@iot-fnd opt]#
```

```
[root@iot-fnd data]# rpm -qa | grep -i postgres
postgresql12-contrib-12.12-1PGDG.rhel8.x86_64
postgresql12-libs-12.12-1PGDG.rhel8.x86_64
postgresql12-server-12.12-1PGDG.rhel8.x86_64
postgresql12-12.12-1PGDG.rhel8.x86_64
cgms-postgres-5.0.0-117.x86_64
[root@iot-fnd data]#
```

Step 3: Copy the Upgrade RPM to the /opt directory.

```
bin boot dev etc home lib lib64 media mnt opt proc root run sbin srv sys usr var
[root@iot-fnd /]# cd /opt/
[root@iot-fnd opt]# ls
cgms-influx cgms-postgres containerd fnd fogd monitor scripts upgrade-ova-5.1.0-155.rpm
[root@iot-fnd opt]#
```

Step 4: Run the Upgrade Command

Example :

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

```
[root@iot-fnd opt]# rpm -Uvh upgrade-ova-5.1.0-155.rpm
```

warning: upgrade-ova-5.1.0-155.rpm: Header V4 RSA/SHA256 Signature, key ID a5a10227: NOKEY

Verifying... ##### [100%]

Preparing... ##### [100%]

Updating / installing...

1:upgrade-ova-5.1.0-155 ##### [100%]

Deleting /var/lib/docker/volumes/fogd_data/_data/dist/appmgr/extensions/fnd/dependencies...

Deletion complete.

Started installer in background. Please check ~/rpm.log in few minutes for details.

[root@iot-fnd opt]#

Mon Jan 12 13:38:02 EST 2026 Background installer started

Mon Jan 12 13:38:02 EST 2026 Please wait until the 'RPM installation completed' message is logged

Mon Jan 12 13:38:02 EST 2026 Upgrading cgms-postgres-5.1.0-155.x86_64.rpm

Verifying... #####

Preparing... #####

Updating / installing...

cgms-postgres-5.1.0-155 #####

Cleaning up / removing...

cgms-postgres-5.0.0-117 #####

Mon Jan 12 13:38:22 EST 2026 Upgrading cgms-influx-5.1.0-155.x86_64.rpm

Verifying... #####

Preparing... #####

Updating / installing...

cgms-influx-5.1.0-155 #####

Cleaning up / removing...

cgms-influx-5.0.0-117 #####

Mon Jan 12 13:38:28 EST 2026 monit-5.33.0-1.e17 already installed on non-RHEL 9 system

Mon Jan 12 13:38:36 EST 2026 Stopping PostgreSQL services

Mon Jan 12 13:39:37 EST 2026 Upgrading Postgresql 16.7

Mon Jan 12 13:39:38 EST 2026 Using RHEL 8.x Installing PostgreSQL 16.7 libraries

warning: postgresql16-libs-16.7-1PGDG.rhel8.x86_64.rpm: Header V4 RSA/SHA256 Signature, key ID 08b40d20

Verifying... #####

Preparing... #####

Updating / installing...

postgresql16-libs-16.7-1PGDG.rhel8 #####

postgresql16-16.7-1PGDG.rhel8 #####

postgresql16-server-16.7-1PGDG.rhel8 #####

postgresql16-contrib-16.7-1PGDG.rhel8 #####

Mon Jan 12 13:39:42 EST 2026 Migrating DB data to Postgresql 16.7

Initializing database ... OK

Created symlink /etc/systemd/system/multi-user.target.wants/postgresql-16.service → /usr/lib/systemd/sy

Performing Consistency Checks

Checking cluster versions ok

Checking database user is the install user ok

Checking database connection settings ok

Checking for prepared transactions ok

Checking for system-defined composite types in user tables ok

Checking for reg* data types in user tables ok

Checking for contrib/isn with bigint-passing mismatch ok

Checking for incompatible "aclitem" data type in user tables ok

Checking for user-defined encoding conversions ok

Checking for user-defined postfix operators ok

Checking for incompatible polymorphic functions ok

Creating dump of global objects ok

Creating dump of database schemas ok

Checking for presence of required libraries ok

Checking database user is the install user	ok
Checking for prepared transactions	ok
Checking for new cluster tablespace directories	ok

If pg_upgrade fails after this point, you must re-initdb the new cluster before continuing.

Performing Upgrade

Setting locale and encoding for new cluster	ok
Analyzing all rows in the new cluster	ok
Freezing all rows in the new cluster	ok
Deleting files from new pg_xact	ok
Copying old pg_xact to new server	ok
Setting oldest XID for new cluster	ok
Setting next transaction ID and epoch for new cluster	ok
Deleting files from new pg_multixact/offsets	ok
Copying old pg_multixact/offsets to new server	ok
Deleting files from new pg_multixact/members	ok
Copying old pg_multixact/members to new server	ok
Setting next multixact ID and offset for new cluster	ok
Resetting WAL archives	ok
Setting frozenxid and minmxid counters in new cluster	ok
Restoring global objects in the new cluster	ok
Restoring database schemas in the new cluster	ok
Copying user relation files	ok
Setting next OID for new cluster	ok
Sync data directory to disk	ok
Creating script to delete old cluster	ok
Checking for extension updates	ok

Upgrade Complete

Optimizer statistics are not transferred by pg_upgrade.

Once you start the new server, consider running:

```
/usr/pgsql-16/bin/vacuumdb --all --analyze-in-stages
```

Running this script will delete the old cluster's data files:

```
./delete_old_cluster.sh
```

Starting new PostgreSQL server...

waiting for server to start.... done

server started

Setting password encryption method to 'scram-sha-256'...

```
ALTER ROLE
```

```
ALTER ROLE
```

Stopping new PostgreSQL server...

waiting for server to shut down.... done

server stopped

Upgrade and password config completed.

Mon Jan 12 13:40:05 EST 2026 Data migration completed

Removed /etc/systemd/system/multi-user.target.wants/postgresql-12.service.

Reinitializing monit daemon

Mon Jan 12 13:40:53 EST 2026 Deleting postgres 12

Updating Subscription Management repositories.

Unable to read consumer identity

This system is not registered with an entitlement server. You can use subscription-manager to register.

Dependencies resolved.

=====

Package	Arch	Version	Repository	Size
---------	------	---------	------------	------

=====
Removing:

postgresql12	x86_64	12.12-1PGDG.rhel8	@commandline	8.6 M
postgresql12-contrib	x86_64	12.12-1PGDG.rhel8	@commandline	2.3 M
postgresql12-libs	x86_64	12.12-1PGDG.rhel8	@commandline	1.5 M
postgresql12-server	x86_64	12.12-1PGDG.rhel8	@commandline	21 M

Transaction Summary
=====

Remove 4 Packages

Freed space: 33 M

Running transaction check

Transaction check succeeded.

Running transaction test

Transaction test succeeded.

Running transaction

Preparing	:		1/1
Running scriptlet:	postgresql12-contrib-12.12-1PGDG.rhel8.x86_64		1/1
Erasing	: postgresql12-contrib-12.12-1PGDG.rhel8.x86_64		1/4
Running scriptlet:	postgresql12-server-12.12-1PGDG.rhel8.x86_64		2/4
Erasing	: postgresql12-server-12.12-1PGDG.rhel8.x86_64		2/4
Running scriptlet:	postgresql12-server-12.12-1PGDG.rhel8.x86_64		2/4
Erasing	: postgresql12-12.12-1PGDG.rhel8.x86_64		3/4
Running scriptlet:	postgresql12-12.12-1PGDG.rhel8.x86_64		3/4
Erasing	: postgresql12-libs-12.12-1PGDG.rhel8.x86_64		4/4
Running scriptlet:	postgresql12-libs-12.12-1PGDG.rhel8.x86_64		4/4
Verifying	: postgresql12-12.12-1PGDG.rhel8.x86_64		1/4
Verifying	: postgresql12-contrib-12.12-1PGDG.rhel8.x86_64		2/4
Verifying	: postgresql12-libs-12.12-1PGDG.rhel8.x86_64		3/4

Verifying : postgresql12-server-12.12-1PGDG.rhel8.x86_64

4/4

Installed products updated.

Removed:

postgresql12-12.12-1PGDG.rhel8.x86_64

postgresql12-contrib-12.12-1PGDG.rhel8.x86_64

postgresql12-libs-12.12-1PGDG.rhel8.x86_64

postgresql12-server-12.12-1PGDG.rhel8.x86_64

Complete!

Mon Jan 12 13:41:00 EST 2026 Using PostgreSQL version 16 for configuration path.
setting idle_in_transaction_session_timeout to 3h

set idle_in_transaction_session_timeout to 3h

Mon Jan 12 13:41:01 EST 2026 Already running influxdb 1.8.3

Mon Jan 12 13:41:04 EST 2026 Already running docker-ce 19.03.15

Mon Jan 12 13:41:04 EST 2026 Restarting services

Mon Jan 12 13:41:34 EST 2026 RPM installation completed

Cisco IoT FND on OVA upgrade is complete.