



# IoT FND Deployment Options

Cisco IoT FND can be deployed in one of three ways. The deployment that you choose depends on a variety of factors, including your operational requirements, features needed, and devices that are to be managed.

Deployment options are:

- **Bare metal server deployment:** IoT FND is installed on a bare metal server and integrated with your existing Oracle database.  
After installing IoT FND, you manually configure the connection to your database, install database certificates, and configure related items. This option provides for the management of all supported devices.
- **VM deployment with Oracle:** A virtual machine (VM) that includes IoT FND and the Oracle database preinstalled and preconfigured is deployed on VMware ESXi 6.5.  
With this deployment, you do not need to manually integrate the database with IoT FND. This option provides for the management of all supported devices.
- **VM deployment with Postgres:** A VM that includes IoT FND and the Postgres database preinstalled and preconfigured is deployed on VMware ESXi 6.5.  
With this deployment, you do not need to manually integrate the database with IoT FND. This option provides for the management of routers only.



**Note** The VM deployment with Oracle and the VM deployment with Postgres options include a distribution license for the database. A support license for the database is not included.

The following table describes key elements of the IoT FND deployment options.

Element	Deployment Option		
	Bare Metal Server Deployment	VM Deployment with Oracle	VM deployment with Postgres
Database	Requires an existing Oracle database in your deployment.	Oracle database included, preinstalled and preconfigured on the provided VM.	Postgres database included, preinstalled and preconfigured on the provided VM.

Element	Deployment Option		
	Bare Metal Server Deployment	VM Deployment with Oracle	VM deployment with Postgres
Installation and configuration process	Install IoT FND and manually configure the connection to your database, install database certificates, and configure related items.	Deploy the VM on which the IoT FND application and the database are preinstalled and preconfigured.	Deploy the VM on which the IoT FND application and the database are preinstalled and preconfigured.
Upgrade process	An upgrade script is not provided for new releases. Install the ISO package for the upgraded software.	An upgrade script is not provided for new releases. Install the OVA package for the upgraded software.	An upgrade script is provided for new releases.
Software host	The IoT FND application and the Oracle database run on a dedicated server.	The IoT FND application and the Oracle database run on the same VM.	The IoT FND application and the Postgres database run on the same VM.
Image distribution	ISO file that contains the RPM installation files. Provided as a ZIP file.	VM with IoT FND and the Oracle database preinstalled. Provided as a ZIP file.	VM with IoT FND and the Postgres database preinstalled. Provided as a ZIP file.
Example image file name	iot-fnd-release_number-build_number-signed.zip	<del>CSCOOIFNDVAK9dceuntahll</del> number-SHA1.zip	<del>CSCOOIFNDVAK9dceuntahll</del> number-SHA1.zip
Devices managed	All supported devices.	All supported devices.	Routers only.
High availability	High availability and load balancing are supported for the IoT FND application server and IoT FND database server.  Load balancing is configured using a third-party load balancing device.	Not supported.	Not supported.
IOx app management	Not supported.	Not supported.	Supported.

- [Bare Metal Server Deployment](#) , on page 2
- [VM Deployment with Oracle](#), on page 4
- [VM Deployment with Postgres](#), on page 4

## Bare Metal Server Deployment

With the bare metal server deployment option, you install IoT FND on a bare metal server and then manually integrate it with your existing Oracle database. This deployment is a large-scale Advanced Metering Infrastructure (AMI) deployment that supports up to 8,000 routers and 8,000,000 endpoints. It provides for

the management of all supported routers, gateways, and endpoints. For information about managed devices, see [IoT FND Managed Devices](#).

This deployment supports high availability for the IoT FND application server and the IoT FND database server in single or cluster IoT FND server deployments.

On the IoT FND application server, high availability is achieved by connecting multiple IoT FND servers to a load balancer. Traffic that originates at routers and endpoints goes to the load balancer, which uses a load balancing algorithm to distribute the load among the IoT FND servers.

On the IoT FND database server, high availability is achieved by configuring two IoT FND database servers: a primary database server and a standby (or secondary) database server. When the primary database server receives new data, it sends a copy to the standby database server. The Observer, a program that monitors the IoT FND database servers, runs on a separate server or the standby server. If the primary database server fails, the Observer configures the standby database server as the new primary database server.

The following steps provide an overview of the implementation procedure for the bare metal server deployment. For detailed installation information and complete steps, see [Cisco IoT Field Network Director Installation Guide – Oracle Deployment](#).

1. Ensure that your environment meets the requirements for installation and obtain the required licenses.
2. Download the IoT FND packages that you need from the [Cisco Software Download page](#) and verify the images.
3. Generate and install certificates for secure communications between IoT FND and devices.
4. Install and configure the IoT FND database.
5. Install and configure the IoT FND.
6. Install and configure the IoT FND TPS proxy.
7. Optionally configure high availability for IoT FND.

The following table describes the files that are included in the distribution for the bare metal server deployment.

File	Description
<code>cgms-release_number-build_number86_64.rpm</code>	Contains the IoT FND installer. Install this package on the IoT FND application server.
<code>cgms-oracle-release_number-build_number86_64.rpm</code>	Contains database template and management tools for the Oracle database. Install this package on the IoT FND database server.
<code>cgms-ssm-release_number-build_number86_64.rpm</code>	Contains the Software Security Module (SSM). Install this package on the IoT FND application server.
<code>cgms-ssm-release_number-build_number86_64.rpm</code>	Contains optional command line tools. If needed, install this package on the IoT FND application server.

File	Description
<i>cgms-tpsproxy-release_number-build_number86_64.rpm</i>	Contains the tunnel provisioning server (TPS) proxy application. Install this package on the IoT FND TPS proxy server.
<i>fnd-ra-release_number-build_number86_64.rpm</i>	Contains the installation file for the registration authority (RA). Install this package on the IoT FND application server.

## VM Deployment with Oracle

With the VM deployment with Oracle option, you deploy an OVA file on VMware ESXi 6.5, a VM in which IoT FND and the Oracle database are preinstalled and preconfigured. This deployment does not require manual integration of the database with IoT FND. In this deployment, both the IoT FND application and database servers run on the same VM.

This deployment is a large-scale AMI deployment for mesh management and supports up to 2,000 routers and 2,000,000 endpoints. It provides for the management of all supported routers, gateways, and endpoints. For information about managed devices, see [IoT FND Managed Devices](#).

This deployment does not support high availability.

The following steps provide an overview of the implementation procedure for the VM deployment with Oracle.

1. Ensure that your environment meets the requirements for installation and obtain the required licenses.
2. Download the IoT FND packages that you need from the Cisco Software Download page and verify the images.
3. Install the OVA file.
4. Install CA certificates and import SUDI certificates.
5. Configure IoT FND.

The following table describes the files that are included in the distribution for the VM deployment with Oracle.

File	Description
<i>iot-fnd-oracle-release_number-build_number_SHA1_signed.ova</i>	Contains the files for deploying the VM with the preinstalled IoT FND application and Oracle database.
<i>iot-tps-release_number-build_number_SHA1_signed.ova</i>	Contains the TPS proxy application.

## VM Deployment with Postgres

With the VM deployment with Postgres option, you deploy an OVA file on VMware ESXi 6.5, a VM in which IoT FND and the Postgres database are preinstalled and preconfigured. This deployment does not require manual integration of the database with IoT FND. In this deployment, both the IoT FND application and database servers run on the same VM.

This option is a small-scale deployment for router management and supports up to 25,000 routers. It provides for the management of all supported gateways and IOx application management. For information about managed devices, see [IoT FND Managed Devices](#).

This deployment includes Influx, an open-source time series database that provides real-time insights on device data. It also includes the Cisco IOx application management service. This service allows you to deploy and manage applications on devices with built-in security for application signing and verification.

This deployment does not support high availability.

The following steps provide an overview of the implementation procedure for the VM deployment with Postgres. For detailed installation information and complete steps, see [Cisco IoT FND Postgres and Influx DB Deployment with Integrated Application Management on OVA](#).

1. Ensure that your environment meets the requirements for installation and obtain the required licenses.
2. Download the IoT FND packages that you need from the [Cisco Software Download page](#) and verify the images.
3. Install the OVA file.
4. Install CA certificates and import SUDI certificates.
5. Configure IoT FND.

The following table describes the files that are included in the distribution for the VM deployment with Postgres.

File	Description
Install scripts (greenfield deployment)	
iot-fnd-release_number-build_number_SHA1_signed.ova	Contains the files for deploying the VM with the preinstalled IoT FND application and database.
iot-tps-release_number-build_number_SHA1_signed.ova	Contains the TPS proxy application.
Upgrade scripts (brownfield deployment)	
CISCO-IOTFND-VPK9-UPGRADE-SCRIPTS-release_number-build_number.zip	Contains upgrade scripts for IoT FND application and Postgres database.

