How to build and install Thingsboard from source

This guide describes how to build and install ThingsBoard on Ubuntu 22.04 LTS.

Step 1. Install Java 17 (OpenJDK)

ThingsBoard service is running on Java 17. To install OpenJDK 17, follow these instructions

```auto
sudo apt update && sudo apt install openjdk-17-jdk-headless
```

Configure your operating system to use **OpenJDK 17 by default**. You can configure the default version by running the following command:

```auto
sudo update-alternatives --config java
```

To check the installed Java version on your system, use the following command:

```auto
java -version
```

The expected result is:

```auto
```

```
openjdk version "17.x.xx"
OpenJDK Runtime Environment (...)
OpenJDK 64-Bit Server VM (...)
```

Step 2. Install Maven

ThingsBoard build requires Maven 3.1.0+

auto

```
sudo apt-get install maven
```

Step 3. Build thingsboard

Run the following command from the ThingsBoard folder to build the project:

auto

```
# checkout latest release branch
git clone https://git.d-soft.com.vn/dng.pj0025.ad2u/visiflow_be.git
cd visiflow_be
git checkout develop
mvn clean install -DskipTests
```

Step 4. [Optional] Build local Docker images

Make sure that **Docker** is installed.

auto

```
mvn clean install -DskipTests -Ddockerfile.skip=false
```

Build artifacts

You can find debian, rpm and windows packages in the target folder:

auto

```
application/target
```

Step 5. ThingsBoard service installation

auto

```
cd application/target
sudo dpkg -i thingsboard-4.2.1.deb
```

Step 6. Configure ThingsBoard database

PostgreSQL Installation

To install the **PostgreSQL** database, run these commands:

auto

```
# Automated repository configuration:
sudo apt install -y postgresql-common
sudo /usr/share/postgresql-common/pgdg/apt.postgresql.org.sh

# install and launch the postgresql service:
sudo apt update
sudo apt -y install postgresql-16
sudo service postgresql start
```

Once **PostgreSQL** is installed, it is recommended to set the password for the **PostgreSQL main user**.

The following command will switch the current user to the PostgreSQL user and set the password directly in PostgreSQL.

auto

```
sudo -u postgres psql -c "\password"
```

Then, **enter and confirm** the password.

Then, connect to the “postgres” database as the “postgres” user:

auto

```
psql -U postgres -d postgres -h 127.0.0.1 -W
```

Create the ThingsBoard database named “thingsboard” :

auto

```
CREATE DATABASE thingsboard;
```

Press “Ctrl+D” twice to exit PostgreSQL.

ThingsBoard Configuration

Edit ThingsBoard configuration file

```
auto
```

```
sudo nano /etc/thingsboard/conf/thingsboard.conf
```

Add the following lines to the configuration file. Don’t forget **to replace** “PUT_YOUR_POSTGRESQL_PASSWORD_HERE” with your **real postgres user password**:

```
auto
```

```
# DB Configuration
export DATABASE_TS_TYPE=sql
export SPRING_DATASOURCE_URL=jdbc:postgresql://localhost:5432/thingsboard
export SPRING_DATASOURCE_USERNAME=postgres
export SPRING_DATASOURCE_PASSWORD=PUT_YOUR_POSTGRESQL_PASSWORD_HERE
# Specify partitioning size for timestamp key-value storage. Allowed values: DAYS, MONTHS, YEARS, INDEFINITE.
export SQL_POSTGRES_TS_KV_PARTITIONING=MONTHS
```

Step 7. [Optional] Memory update for slow machines (4GB of RAM)

Edit ThingsBoard configuration file

```
auto
```

```
sudo nano /etc/thingsboard/conf/thingsboard.conf
```

Add the following lines to the configuration file.

auto

```
# Update ThingsBoard memory usage and restrict it to 2G in /etc/thingsboard/conf/thingsboard.conf
export JAVA_OPTS="$JAVA_OPTS -Xms2G -Xmx2G"
```

Step 8. Run installation script

Once ThingsBoard service is installed and DB configuration is updated, you can execute the following script:

auto

```
# --loadDemo option will load demo data: users, devices, assets, rules, widgets.
sudo /usr/share/thingsboard/bin/install/install.sh --loadDemo
```

Step 9. Start ThingsBoard service

Execute the following command to start ThingsBoard:

auto

```
sudo service thingsboard start
```

Once started, you will be able to open Web UI using the following link:

```auto
http://localhost:8080/
```

The following default credentials are available if you have specified *–loadDemo* during execution of the installation script:

- **System Administrator**: sysadmin@thingsboard.org / sysadmin
- **Tenant Administrator**: tenant@thingsboard.org / tenant
- **Customer User**: customer@thingsboard.org / customer

You can always change passwords for each account in account profile page.

Step 10. [Optional] Setup for Thingsboard UI development

How to Thingsboard UI development without build it all

```auto
cd ~/thingsboard/ui-ngx
yarn install
yarn start
```

Any UI changes in `ngx-ui` will be updated in:

```auto
```

```
http://localhost:4200/
```

Troubleshooting

ThingsBoard logs are stored in the following directory:

```auto
/var/log/thingsboard
```

You can issue the following command in order to check if there are any errors on the backend side:

```auto
cat /var/log/thingsboard/thingsboard.log | grep ERROR
```