

Linux Ubuntu Installation



Before installing NetVizura make sure to set the time on your server correctly. Time change after the installation will invalidate the license!



Before installing NetVizura you will have to install: Oracle Java 1.7, Tomcat 7 and PostgreSQL 9.3 or higher, in that order. The installation process has been tested on Ubuntu 14.

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NetVizura Installation Steps

To install NetVizura follow these steps:

Step 1: sudo package installation: execute `apt-get install sudo`

Step 2: Oracle Java 1.7 package installation:



Default Java implementation is OpenJDK. You need to install Oracle Java package. Java packages should be installed before the Tomcat7 packages, if not Tomcat will use OpenJDK

1. in file `/etc/apt/sources.list`, add the following lines:

```
deb http://ppa.launchpad.net/webupd8team/java/ubuntu trusty main
deb-src http://ppa.launchpad.net/webupd8team/java/ubuntu trusty main
```

2. execute command `apt-get update`

1. a. ignore the error about "public key is not available"



If you receive something like:

*W: GPG error: <http://ppa.launchpad.net> trusty InRelease: The following signatures couldn't be verified because the public key is not available:
NO_PUBKEY C2518248EEA14886*

W: Failed to fetch <http://security.ubuntu.com/ubuntu/dists/trusty-security/main/source/Sources> Hash Sum mismatch

W: Failed to fetch <http://security.ubuntu.com/ubuntu/dists/trusty-security/universe/source/Sources> Hash Sum mismatch

W: Failed to fetch <http://security.ubuntu.com/ubuntu/dists/trusty-security/main/binary-amd64/Packages> Hash Sum mismatch

W: Failed to fetch <http://security.ubuntu.com/ubuntu/dists/trusty-security/universe/binary-amd64/Packages> Hash Sum mismatch

W: Failed to fetch <http://security.ubuntu.com/ubuntu/dists/trusty-security/main/binary-i386/Packages> Hash Sum mismatch

W: Failed to fetch <http://security.ubuntu.com/ubuntu/dists/trusty-security/universe/binary-i386/Packages> Hash Sum mismatch

E: Some index files failed to download. They have been ignored, or old ones used instead.

enter the following commands:

```
rm /var/lib/apt/lists/* -vf
apt-get update
```

3. execute command `apt-get install oracle-java7-installer` and answer affirmatively to "Proceed without verification" and all other installation questions

4. execute command `ln -s /usr/lib/jvm/java-7-oracle /usr/lib/jvm/default-java` to set Oracle's Java as a default Java on the system

5. check if java is properly installed with command `java -version`

Step 3: Tomcat 7 package installation:

1. execute command `apt-get install tomcat7`
2. start Tomcat: `service tomcat7 start`
3. verify that Tomcat is running properly with the command `service tomcat7 status`

Step 4: PostgreSQL package installation

1. Create a file `pgdg.list` in `/etc/apt/sources.list.d/` with some text editor:

`nano /etc/apt/sources.list.d/pgdg.list` and add the following line:

- ```
deb http://apt.postgresql.org/pub/repos/apt/ trusty-pgdg main
```
2. execute command: `wget --quiet -O - http://apt.postgresql.org/pub/repos/apt/ACCC4CF8.asc | sudo apt-key add -`
  3. execute command `apt-get update`
  4. execute command `apt-get install postgresql postgresql-client`
  5. verify that PostgreSQL is running properly with the command `service postgresql status`

### Step 5: NetVizura package installation

After this steps, install the NetVizura package downloaded from the website with the command: `dpkg -i downloaded_file_name.deb`

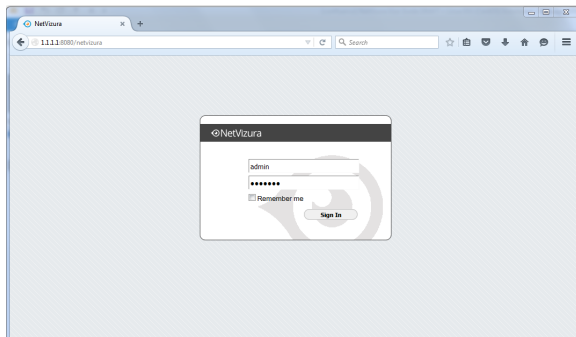
### Step 6: Verify installation

Now you can go to NetVizura web interface <http://serverip:8080/netvizura>.

Default login credentials:

- Username: **admin**
- Password: **admin01**

For example, if your server IP is 1.1.1.1 then point your browser to <http://1.1.1.1:8080/netvizura> like in the screenshot below:



## Post Install Steps

### Tomcat Memory Allocation

After installation tweaking of configuration files is required in order to utilize the installed RAM to the fullest extent. The main consumers of RAM are operating system, PostgreSQL database and Tomcat. General rule for distributing memory is to split it in ratio 2:1 between PostgreSQL and Tomcat with 1 GB or more reserved for operating system. For instance:

| Installed RAM | PostgreSQL | Tomcat | OS   |
|---------------|------------|--------|------|
| 4 GB          | 2 GB       | 1 GB   | 1 GB |
| 16 GB         | 10 GB      | 5 GB   | 1 GB |

During installation NetVizura automatically allocates memory for Tomcat process. The amount allocated to Tomcat process is calculated according to the formula:

$$(RAM_{total} - 1GB) / 3 \text{ but no less than } 1GB.$$

For instance:

| Total RAM | Tomcat |
|-----------|--------|
| 3 GB      | 1 GB   |
| 4 GB      | 1 GB   |
| 16 GB     | 5 GB   |

However, if you need to tweak Tomcat RAM allocation differently (the example for 2048MB):

1. Edit file `/etc/default/tomcat7`
2. Locate `JAVA_OPTS` environment variable that defines memory and uncomment it if it is commented. This line looks something like the following:  
`JAVA_OPTS="{JAVA_OPTS} -Xmx1024m -Xms1024m +UseConcMarkSweepGC"`
3. Modify the `-Xmx` parameter to allocate additional memory to Tomcat. Additionally, set parameter `-Xms` to the same amount. This should look something like:  
`JAVA_OPTS="-Djava.awt.headless=true -Xmx2048M -Xms2048M -XX:+UseConcMarkSweepGC"`

1. Save the file and restart Tomcat: `service tomcat7 restart`

## Tweaking PostgreSQL

Tweaking PostgreSQL for best performance is a topic on which many books were written, but the following are some common sense suggestions. In general there are two groups of PostgreSQL tweaks that are helpful for NetVizura performance - "safe" and "unsafe" tweaks. "Safe" tweaks are those which can be applied in all cases. "Unsafe" tweaks trade reliability for performance. For the curious ones recommended reads (among countless others) are [PostgreSQL Optimization Guide](#), [PostgreSQL Tuning Guide](#), this [article](#) and this [book](#).

In order to apply following tweaks edit file `/etc/postgresql/PG_VERSION_NUMBER/main/postgresql.conf`. You will need to restart the PostgreSQL service after done editing with command: `service postgresql restart`. Almost all of the following parameters are commented with carron character (#). Although these tweaks are considered "safe" do take notice of the default values. Usually you can comment out the parameter that has been changed and PostgreSQL will revert to the default value.

### PostgreSQL "safe" tweaks

In the following example it is assumed that 4 GB of RAM is allocated for PostgreSQL.

| parameter                                 | recommended value | comment                                                                                              |
|-------------------------------------------|-------------------|------------------------------------------------------------------------------------------------------|
| <code>max_connections</code>              | 30                | NetVizura rarely uses more than 10 connections simultaneously, but it is good to have some reserve   |
| <code>shared_buffers</code>               | 1024MB            | the recommended amount is $RAM/4$                                                                    |
| <code>effective_cache_size</code>         | 2048MB            | the recommended amount is $RAM/2$ , possibly even $RAM * 3/4$                                        |
| <code>checkpoint_segments</code>          | 32                | for write intensive apps (as NetVizura) it should be at least 16, with 32 as safe maximum            |
| <code>checkpoint_completion_target</code> | 0.9               |                                                                                                      |
| <code>default_statistics_target</code>    | 100               |                                                                                                      |
| <code>work_mem</code>                     | 8MB - 12MB        | The formula used is $max\_connections * work\_mem \leq RAM/8$ , but using a bit more is still "safe" |

### PostgreSQL "unsafe" tweaks

These optimizations are considered "unsafe" since they *could* in very rare cases lead to data loss and/or corruption. If your VM is properly backed up we would consider the following optimizations safe. The following bring huge performance boosts to DB write process.

| parameter | recommended value | comment |
|-----------|-------------------|---------|
|-----------|-------------------|---------|

|                      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| maintenance_work_mem | 32MB | speeds up DB self clean process, not really important                                                                                                                                                                                                                                                                                                                                                                                                                       |
| wal_buffers          | 16MB |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| full_page_writes     | off  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| fsync                | off  | don't wait for HDD to finish previous <i>write</i> operation. This brings the most benefit, but is considered potentially the most unsafe of all. If there is OS or HDD failure in exact instant when PSQl issues write command to HDD, that data will be lost and the DB itself could be corrupted. On the other hand, DB can issue several magnitude more write commands in the same time period and consider all these done, thus improving write performance immensely. |
| synchronous_commit   | off  | similarly to "fsync" but less unsafe and with less benefit                                                                                                                                                                                                                                                                                                                                                                                                                  |
| checkpoint_segments  | 64   | how much is cached in temp files before it is issued to <i>proper</i> DB files. Issuing big chunks of data for write rarely is usually better for performance than issuing small chunks often                                                                                                                                                                                                                                                                               |