



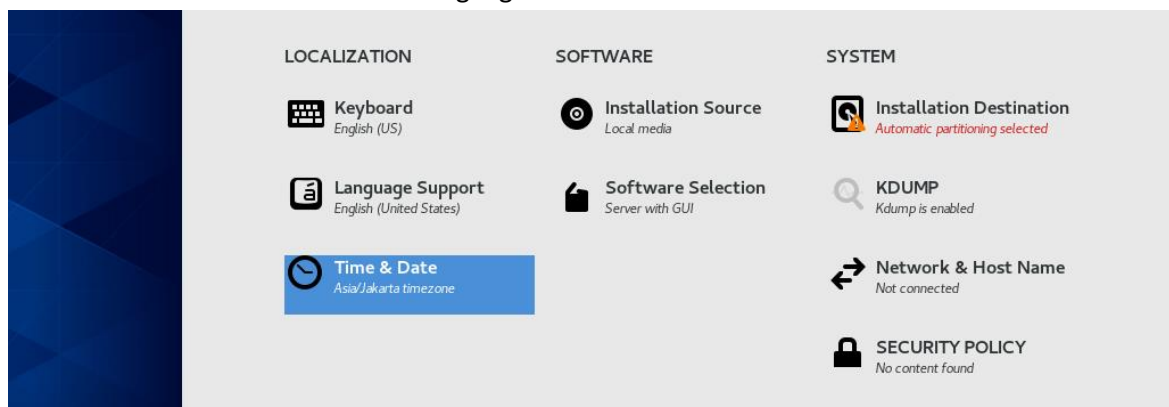
# DNS Sinkhole with Pi-hole

Step by Step Pi-hole Configuration on Centos 8

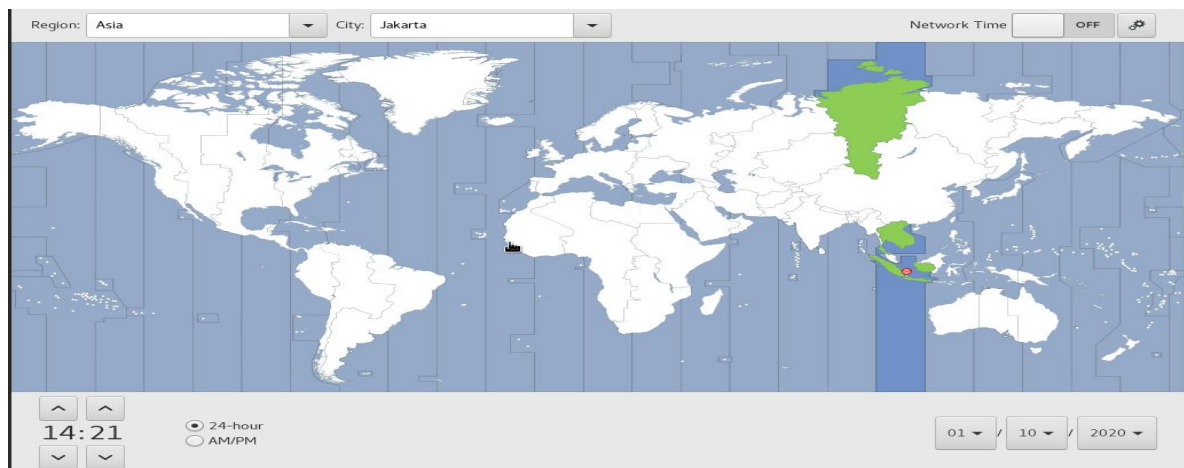
## A. CENTOS 8 INSTALLATION

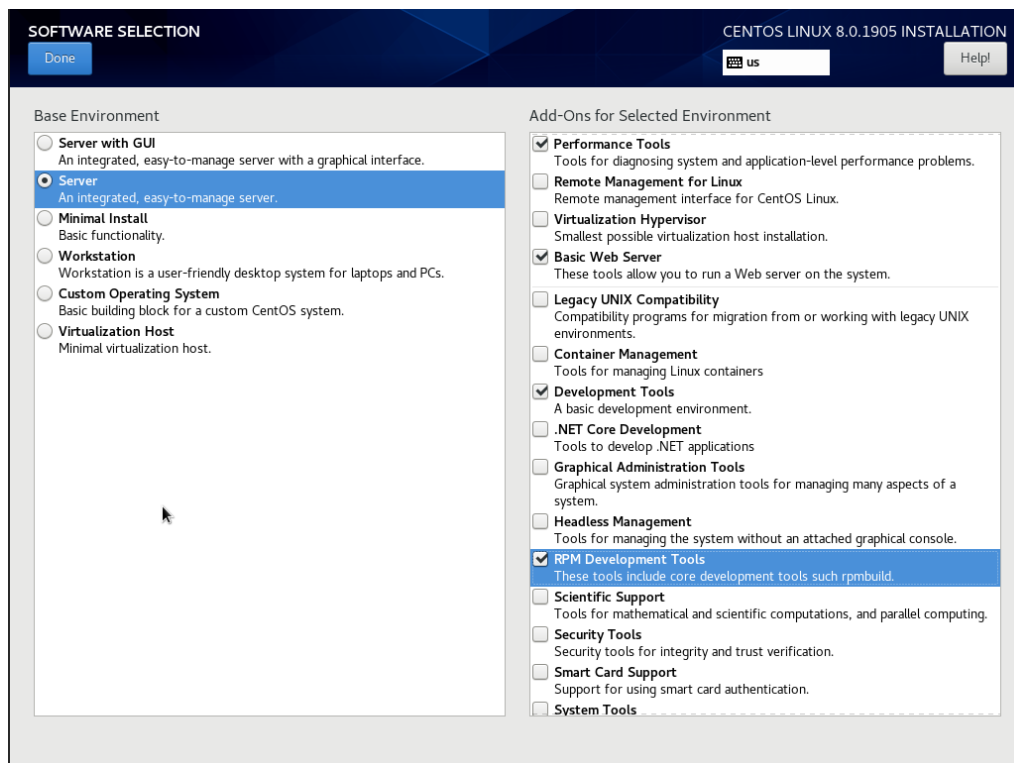


1. Choose Centos 8 Installation Language and Click Continue.

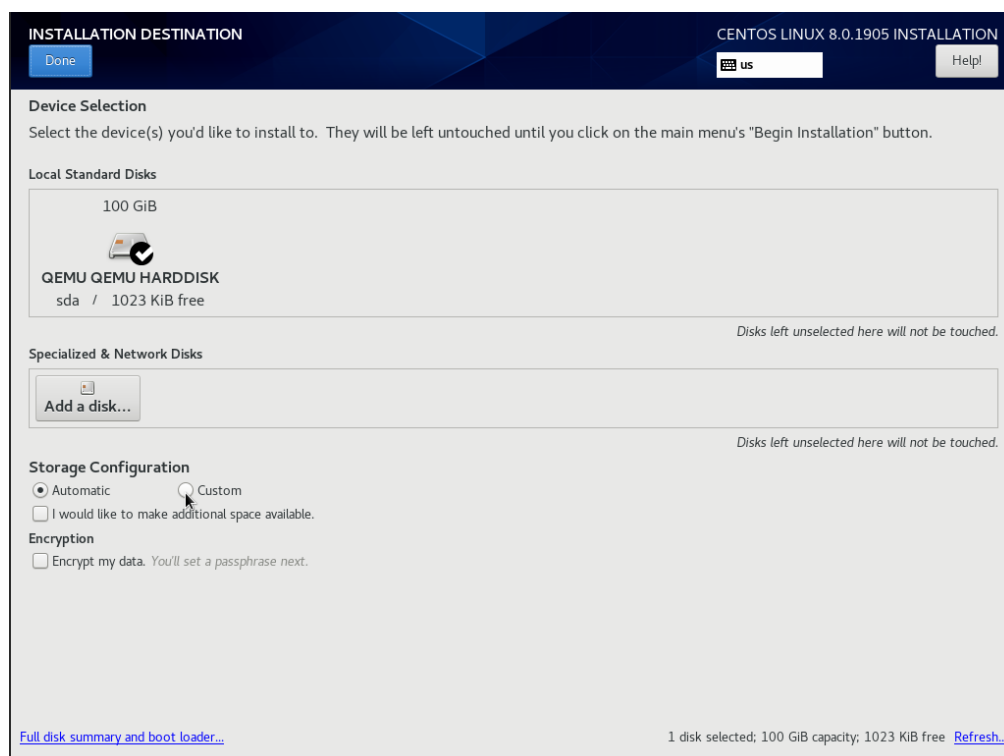


2. Centos 8 will displaying an installation summary. Click Time & Date to set your timezone. I choose Asia/Jakarta.

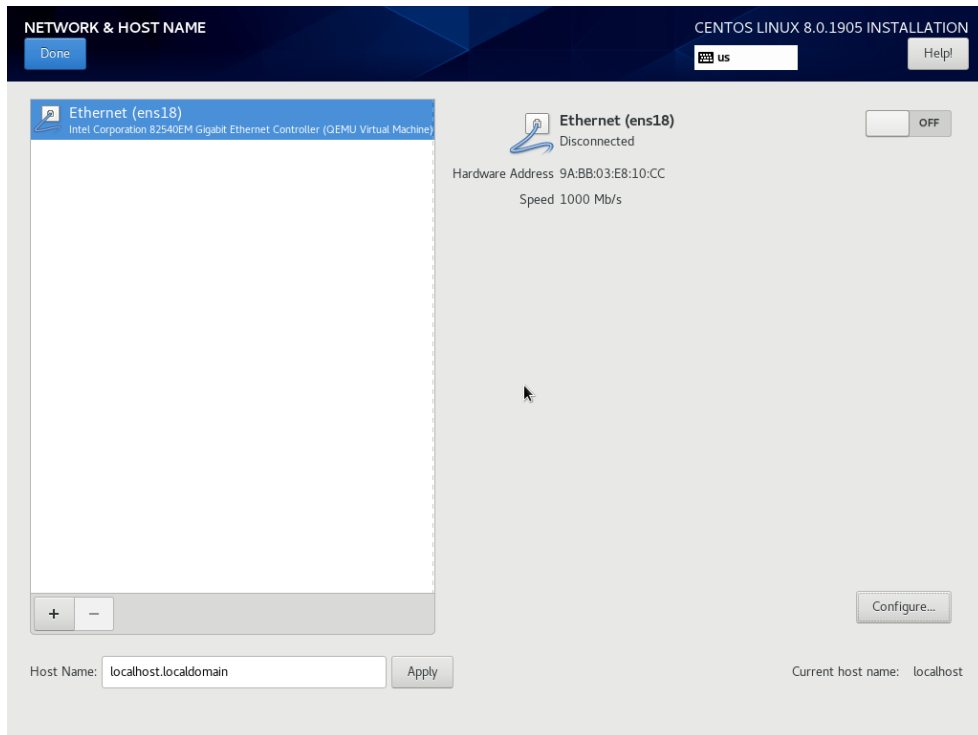




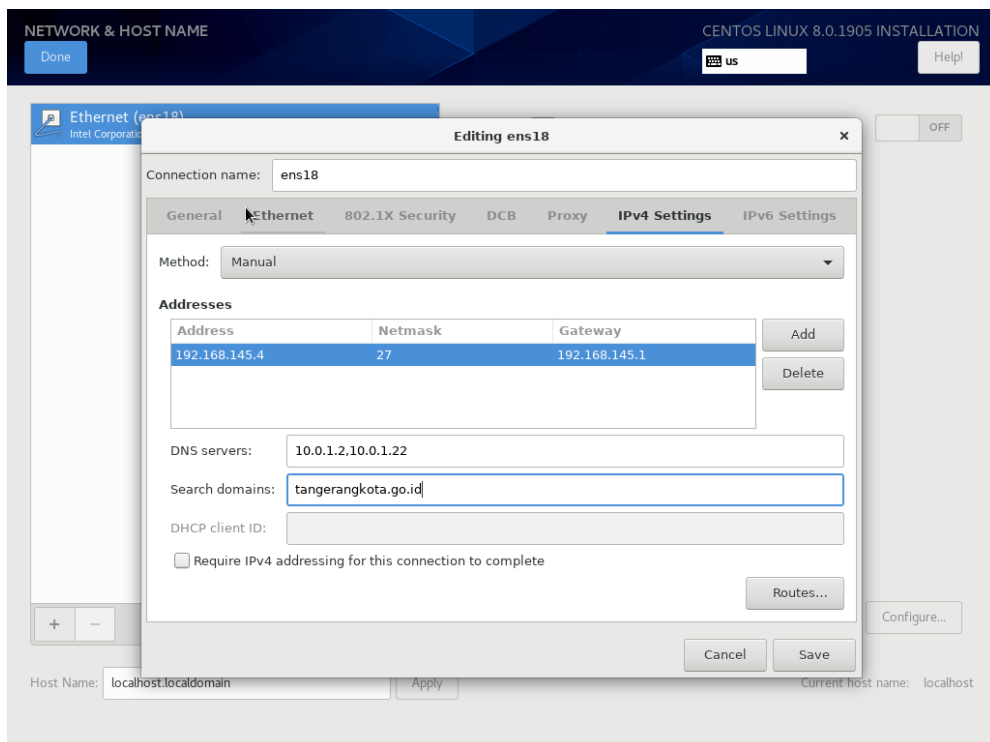
3. After you choose server's timezone, the installation summary will appear again. Click software selection. Choose server and select the following add-ons above. Click done.



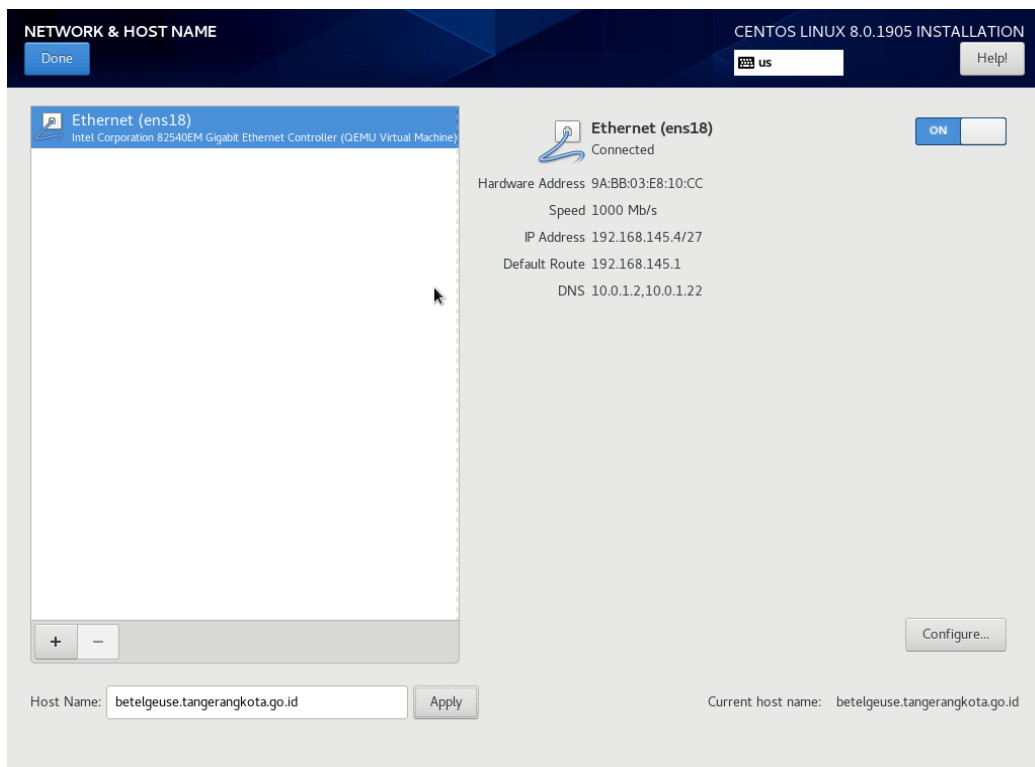
4. Click Installation Destination. You can decided your own storage configuration with choose custom. But in this module, I choose automatic. The system will create partition automatically.



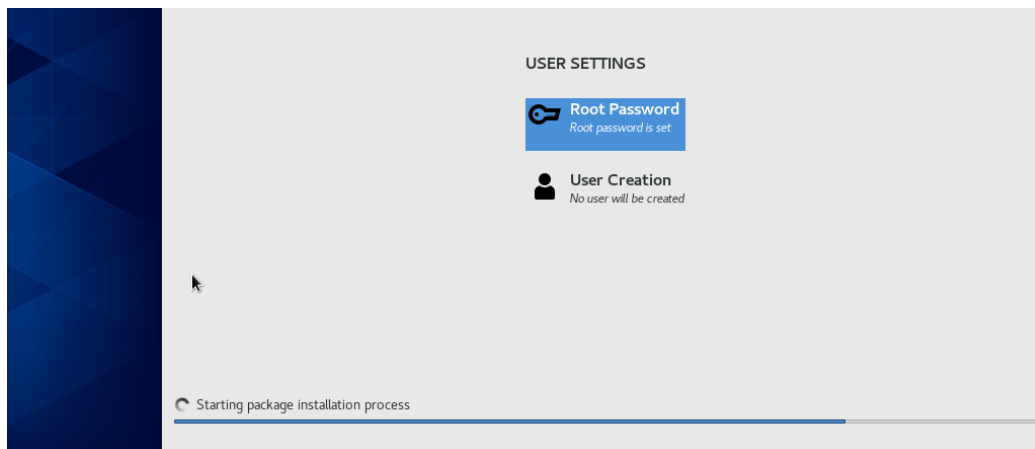
5. If you have an active internet connection, you can configure server's IP Address in installation step. Click Network & Host Name on installation summary and then click configure.



6. Click IPv4 Setting tab, set your IP Address and DNS server(s). If finished, click Save.

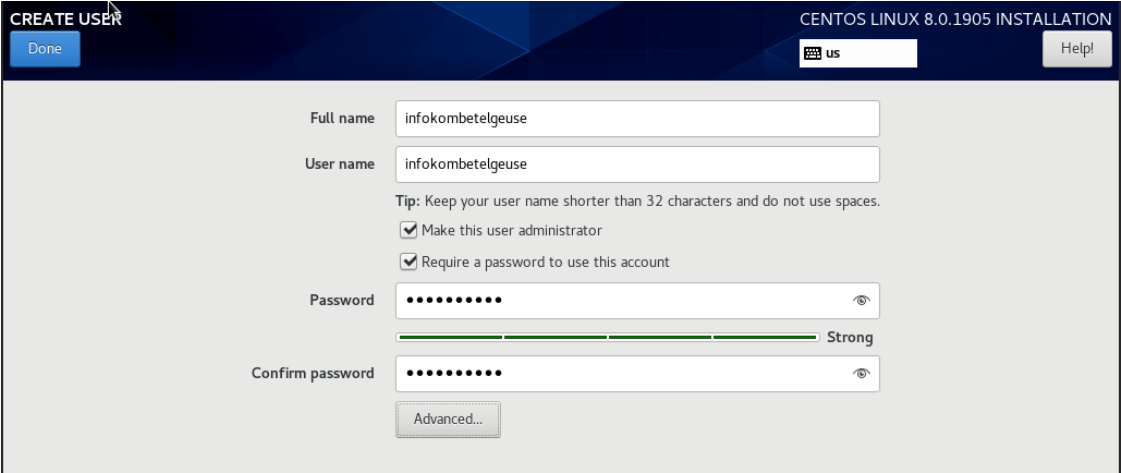


7. Turn on the network interface. Your IP Address which you configured will be appear. You can also set your hostname here. Decide your hostname (FQDN) like server1.domain.com, etc. If finished, click done.



8. After you configured server's IP and Host Name, the installation summary display will appear again. Click begin installation. The system will starting centis 8 installation. During the installation, you can set root password and add user or sudoers user. To set your root's password, click Root Password. To add another user, click User Creation.

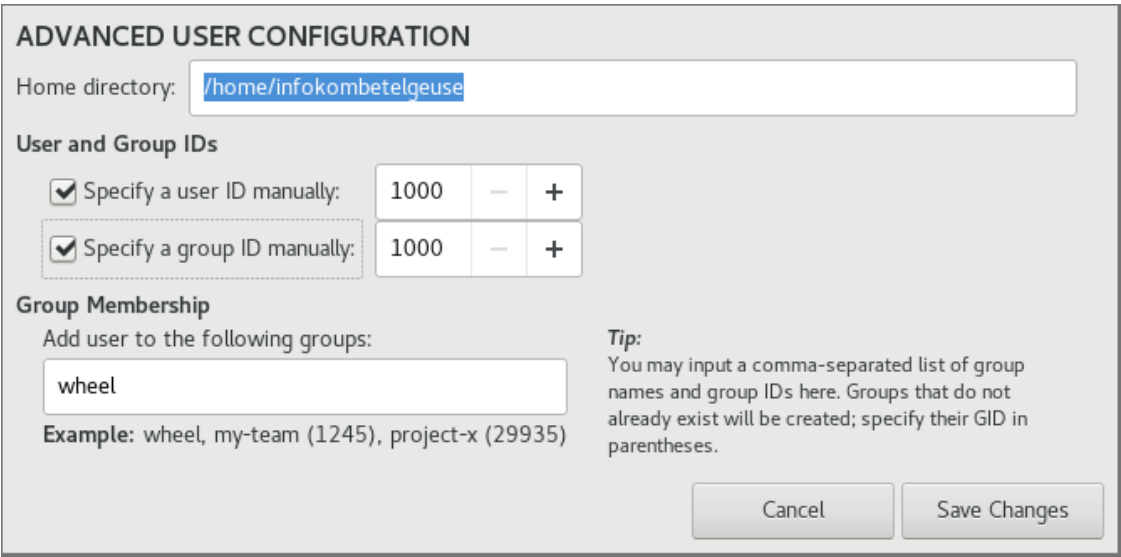
9.



The screenshot shows the 'CREATE USER' window in the CentOS Linux 8.0.1905 installer. The window has a dark blue header with the title 'CREATE USER' and a 'Done' button. The main area is light gray and contains the following fields and options:

- Full name:** infokombetelgeuse
- User name:** infokombetelgeuse
- Tip:** Keep your user name shorter than 32 characters and do not use spaces.
- ☒ **Make this user administrator**
- ☒ **Require a password to use this account**
- Password:** A field with 8 dots and a 'Strong' indicator bar.
- Confirm password:** A field with 8 dots.
- Advanced...** button.

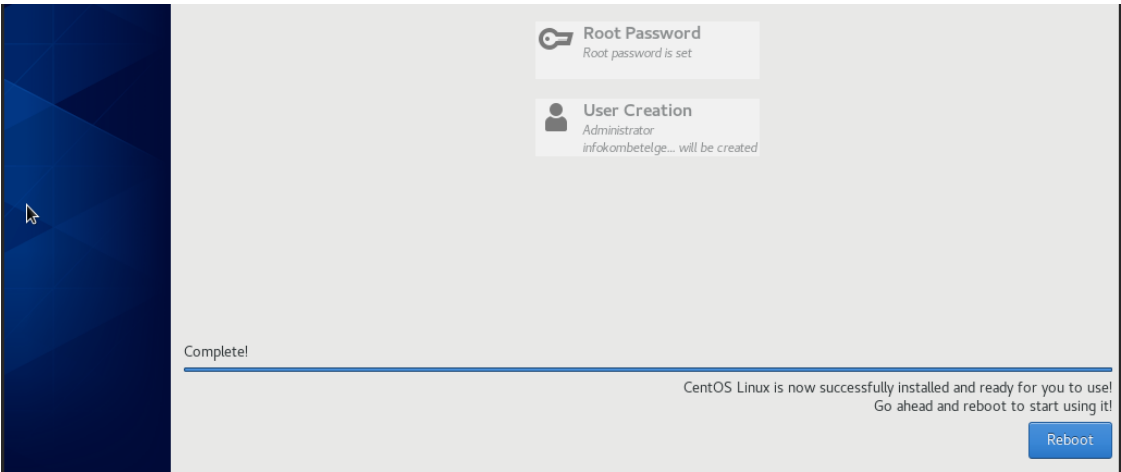
10. Add your user. If you want to create sudoer user, click advance.



The screenshot shows the 'ADVANCED USER CONFIGURATION' window. It contains the following fields and options:

- Home directory:** /home/infokombetelgeuse
- User and Group IDs:**
  - ☒ **Specify a user ID manually:** 1000
  - ☒ **Specify a group ID manually:** 1000
- Group Membership:**
  - Add user to the following groups:** wheel
  - Example:** wheel, my-team (1245), project-x (29935)
- Tip:** You may input a comma-separated list of group names and group IDs here. Groups that do not already exist will be created; specify their GID in parentheses.
- Buttons:** Cancel, Save Changes

11. The Dialog box will appear. Check Specify a user ID and group ID manually and make sure user ID and group ID set to 1000. Then, add user to wheel group. Click Save Changes, and click done on Create User's form.



The screenshot shows the completion screen of the CentOS Linux 8.0.1905 installer. It features a dark blue sidebar on the left and a light gray main area. The main area contains the following elements:

- Root Password:** Root password is set
- User Creation:** Administrator infokombetelge... will be created
- Complete!** progress bar
- Message:** CentOS Linux is now successfully installed and ready for you to use! Go ahead and reboot to start using it!
- Reboot** button

12. Wait for a while, if Centos 8 installation finished, reboot the server.

## B. CENTOS 8 CONFIGURATION

```
GNU nano 2.9.8 /etc/selinux/config Modified
# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
#   enforcing - SELinux security policy is enforced.
#   permissive - SELinux prints warnings instead of enforcing.
#   disabled - No SELinux policy is loaded.
#SELINUX=enforcing
SELINUX=disabled
# SELINUXTYPE= can take one of these three values:
#   targeted - Targeted processes are protected,
#   minimum - Modification of targeted policy. Only selected processes are protected.
#   mls - Multi Level Security protection.
SELINUXTYPE=targeted
```

1. Before you begin Pi-Hole installation, login as root and turn your selinux into disabled.

```
# nano /etc/selinux/config
```

```
GNU nano 2.9.8 /etc/sysconfig/network-scripts/ifcfg-ens18 Modified
TYPE="Ethernet"
PROXY_METHOD="none"
BROWSER_ONLY="no"
BOOTPROTO="none"
DEFROUTE="yes"
IPV4_FAILURE_FATAL="no"
IPV6INIT="yes"
IPV6_AUTOCONF="yes"
IPV6_DEFROUTE="yes"
IPV6_FAILURE_FATAL="no"
IPV6_ADDR_GEN_MODE="stable-privacy"
NAME="ens18"
UUID="a694eb3c-10c0-4482-8ad1-9e9751820f15"
DEVICE="ens18"
ONBOOT="yes"
IPADDR="172.16.9.13"
PREFIX="24"
GATEWAY="172.16.9.1"
DNS1="172.16.9.2"
DOMAIN="tangerangkota.go.id"
IPV6_PRIVACY="no"
```

2. You can also re-configure server ip's with following command.

```
# nano /etc/sysconfig/network-scripts/ifcfg-[iface_name]
```

```
IPADDR      = "172.16.9.13" -> Your Server's IP
PREFIX      = "24" -> IP Netmask (Range : 8 to 30)
GATEWAY     = "172.16.9.1" -> Your server's gateway
DNS1        = "172.16.9.2" -> Your server's DNS Primary
DOMAIN      = "tangerangkota.go.id" -> Domain name of DNS
```

To restart the network service, run this command below.

```
# nmcli networking off
# nmcli networking on
```

OR

```
# systemctl restart NetworkManager
```

**NOTE : IF IP ADDRESS CAN'T CHANGE AFTER NETWORKING SERVICE RESTARTED, YOU CAN RUN THIS COMMAND BELLOW OR REBOOT YOUR SERVER.**

```
# ifdown [iface_name]
# ifup [iface_name]
```

```
Port 1212
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::
```

```
# Authentication:
#LoginGraceTime 2m
PermitRootLogin no_
#StrictModes yes
#MaxAuthTries 6
#MaxSessions 10
```

3. Configure your ssh server. For security reason, change the ssh's default port to free port and set PermitRootLogin to no. Run command below and follow example above.

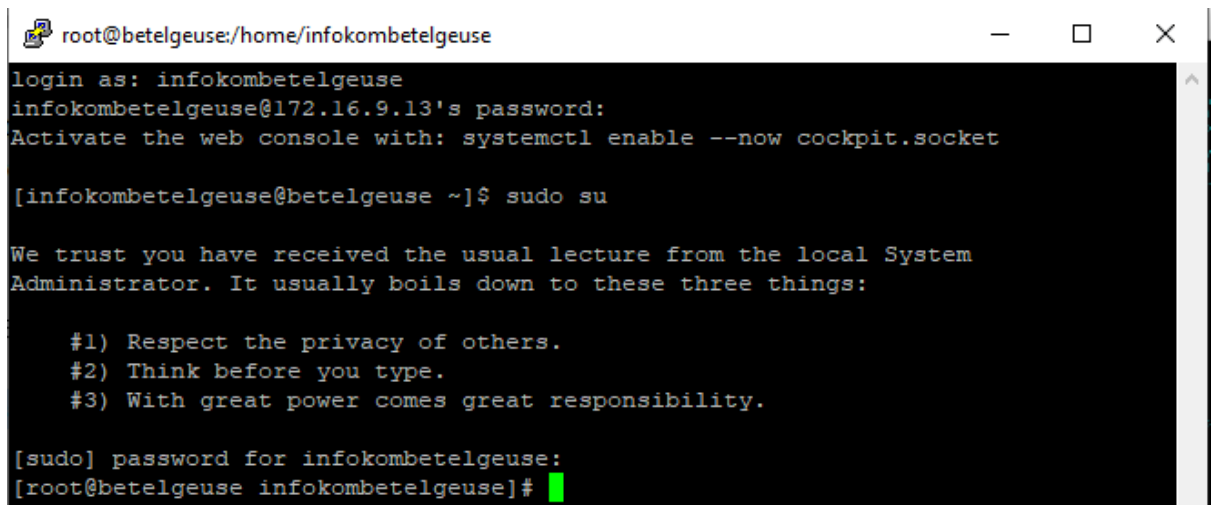
```
# nano /etc/ssh/sshd_config
```

Set selinux to permissive, open new ssh port, and restart ssh service.

```
# setenforce 0
```

```
[root@betelgeuse ~]# firewall-cmd --perma --add-port=1212/tcp
success
[root@betelgeuse ~]# firewall-cmd --reload
success
[root@betelgeuse ~]# systemctl restart sshd
[root@betelgeuse ~]#
```

```
# systemctl restart sshd
```



```
root@betelgeuse:/home/infokombetelgeuse
login as: infokombetelgeuse
infokombetelgeuse@172.16.9.13's password:
Activate the web console with: systemctl enable --now cockpit.socket

[infokombetelgeuse@betelgeuse ~]$ sudo su

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

#1) Respect the privacy of others.
#2) Think before you type.
#3) With great power comes great responsibility.

[sudo] password for infokombetelgeuse:
[root@betelgeuse infokombetelgeuse]#
```

4. Try to login into your server with ssh client like putty, etc.



```

Transaction Summary
=====
Install      6 Packages
Upgrade    114 Packages

Total download size: 170 M
Downloading Packages:
CentOS-8 - AppStream195% [=====] 1.4 kB/s | 1.
(1/120): kernel-4.18.0-80.11.2.el8_0.x86_64.rpm 244 kB/s | 424 kB    00:01
(2/120): grub2-tools-efi-2.02-66.el8_0.1.x86_64 218 kB/s | 444 kB    00:02
(3/120): kernel-debug-devel-4.18.0-80.11.2.el8_ 957 kB/s | 12 MB     00:13
(4/120): kernel-devel-4.18.0-80.11.2.el8_0.x86_ 762 kB/s | 12 MB     00:16
(5/120): bind-libs-9.11.4-17.P2.el8_0.1.x86_64. 564 kB/s | 169 kB    00:00
(6/120): bind-libs-lite-9.11.4-17.P2.el8_0.1.x8 1.3 MB/s | 1.1 MB    00:00
(7/120): bind-license-9.11.4-17.P2.el8_0.1.noar 924 kB/s | 98 kB     00:00
(8/120): bind-utils-9.11.4-17.P2.el8_0.1.x86_64 446 kB/s | 433 kB    00:00
(9/120): gdb-8.2-6.el8_0.x86_64.rpm             1.0 MB/s | 296 kB    00:00
(10/120): gdb-headless-8.2-6.el8_0.x86_64.rpm    1.0 MB/s | 3.7 MB    00:03
(11-13/120): kernel- 35% [=====] 2.6 MB/s | 60 MB    00:42 ETA

```

5. Update Centos 8 with command below. Wait until Centos 8 finished upgrading system, then reboot.

```

# dnf upgrade -y
# reboot

```

## C. PI-HOLE INSTALLATION

### 1. Install php7.4 with following instruction below.

#### a. Install epel repo and remi repo

```
# dnf install https://dl.fedoraproject.org/pub/epel/epel-release-latest-8.noarch.rpm -y
# dnf install https://rpms.remirepo.net/enterprise/remi-release-8.rpm -y
```

#### b. Check php module list and Install PHP7.4

```
# dnf module list php
# dnf module enable php:remi-7.4 -y
```

```
[root@betelgeuse ~]# dnf module list php
Remi's Modular repository for Enterprise Linux 123 kB/s | 528 kB 00:04
Safe Remi's RPM repository for Enterprise Linux 302 kB/s | 1.4 MB 00:04
CentOS-8 - AppStream
Name      Stream      Profiles                               Summary
php       7.2 [d]     common [d], devel, minimal          PHP scripting language

Remi's Modular repository for Enterprise Linux 8 - x86_64
Name      Stream      Profiles                               Summary
php       remi-7.2    common [d], devel, minimal          PHP scripting language
php       remi-7.3    common [d], devel, minimal          PHP scripting language
php       remi-7.4    common [d], devel, minimal          PHP scripting language

Hint: [d]efault, [e]nabled, [x]disabled, [i]nstalled
[root@betelgeuse ~]#
```

```
# dnf install php php-cli php-common php-json php-xml php-mbstring php-mysql php-zip php-intl
```

### 2. Install Lighttpd

#### a. Install Lighttpd From Source

```
# dnf install -y autoconf make automake libtool pcre-devel
zlib-devel bzip2-devel git
# git clone https://git.lighttpd.net/lighttpd/lighttpd1.4.git
# cd lighttpd1.4/
# ./autogen.sh && ./configure --disable-dependency-tracking
# make && make install
```

#### b. Create Startup Script for Lighttpd

```
cat << EOF > /etc/systemd/system/lighttpd.service

[Unit]

Description=Lightning Fast Webserver With Light System
Requirements

After=syslog.target network-online.target
```

```
[Service]
PIDFile=/var/run/lighttpd.pid
EnvironmentFile=-/etc/sysconfig/lighttpd
ExecStart=/usr/local/sbin/lighttpd -D -f
/etc/lighttpd/lighttpd.conf

[Install]
WantedBy=multi-user.target
EOF
```

c. Reload Daemon and Enable Lighttpd

```
# systemctl daemon-reload
# systemctl enable lighttpd
```

d. Configure Lighttpd Directory

```
# mkdir -p /srv/www
# mkdir -p /etc/lighttpd/conf.d
# mkdir /etc/lighttpd/vhosts.d
# cp doc/config/*.conf /etc/lighttpd/
# cp doc/config/conf.d/*.conf /etc/lighttpd/conf.d
```

e. Add user and group for Lighttpd Process

```
# groupadd lighttpd
# useradd -r -M -g lighttpd lighttpd
```

f. Configure Lighttpd Log Directory

```
# mkdir /var/log/lighttpd
# chown lighttpd: /var/log/lighttpd
```

g. Start Lighttpd Service

```
# systemctl start lighttpd
```

```
# systemctl status lighttpd
```

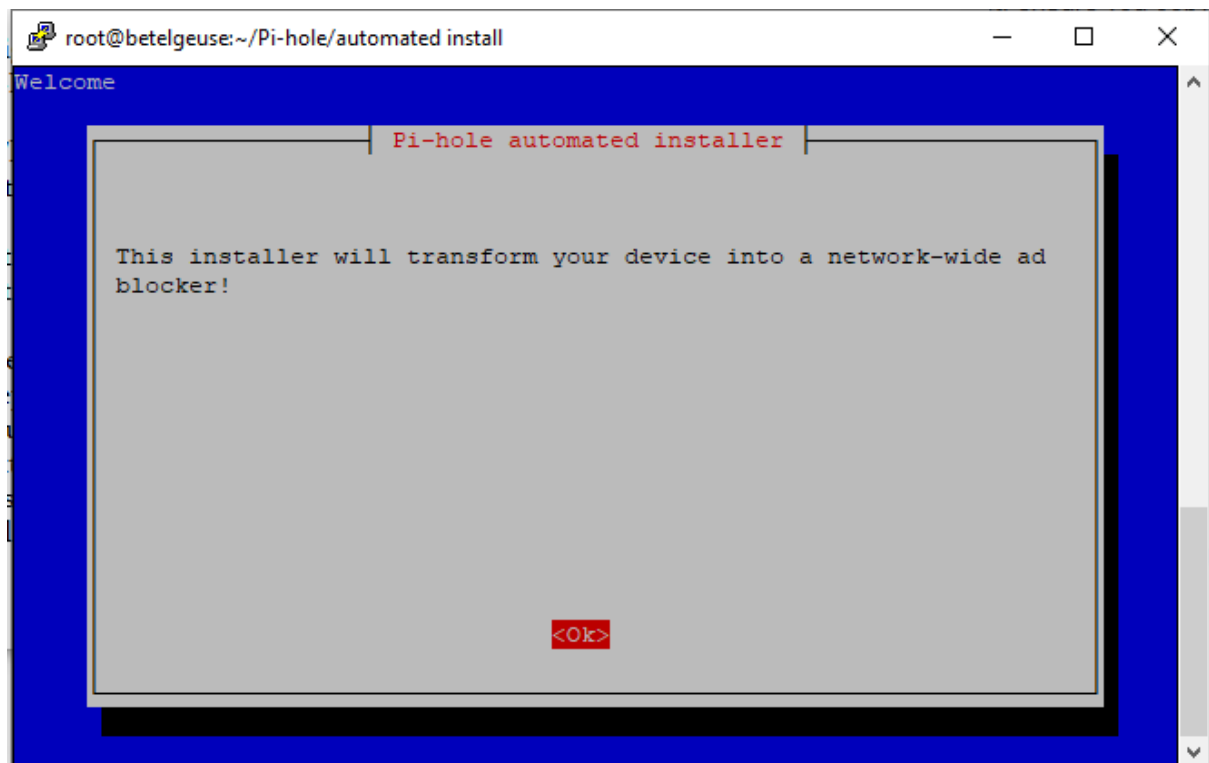
```
[root@betelgeuse ~]# systemctl start lighttpd
[root@betelgeuse ~]# systemctl status lighttpd
● lighttpd.service - Lightning Fast Webserver With Light System Requirements
   Loaded: loaded (/etc/systemd/system/lighttpd.service; enabled; vendor preset:
   Active: active (running) since Fri 2020-01-10 15:35:36 WIB; 4s ago
     Main PID: 589 (lighttpd)
        Tasks: 1 (limit: 24012)
       Memory: 1012.0K
       CGroup: /system.slice/lighttpd.service
              └─589 /usr/local/sbin/lighttpd -D -f /etc/lighttpd/lighttpd.conf

Jan 10 15:35:36 betelgeuse.tangerangkota.go.id systemd[1]: Started Lightning Fa
Jan 10 15:35:36 betelgeuse.tangerangkota.go.id lighttpd[589]: 2020-01-10 15:35:
lines 1-11/11 (END)
```

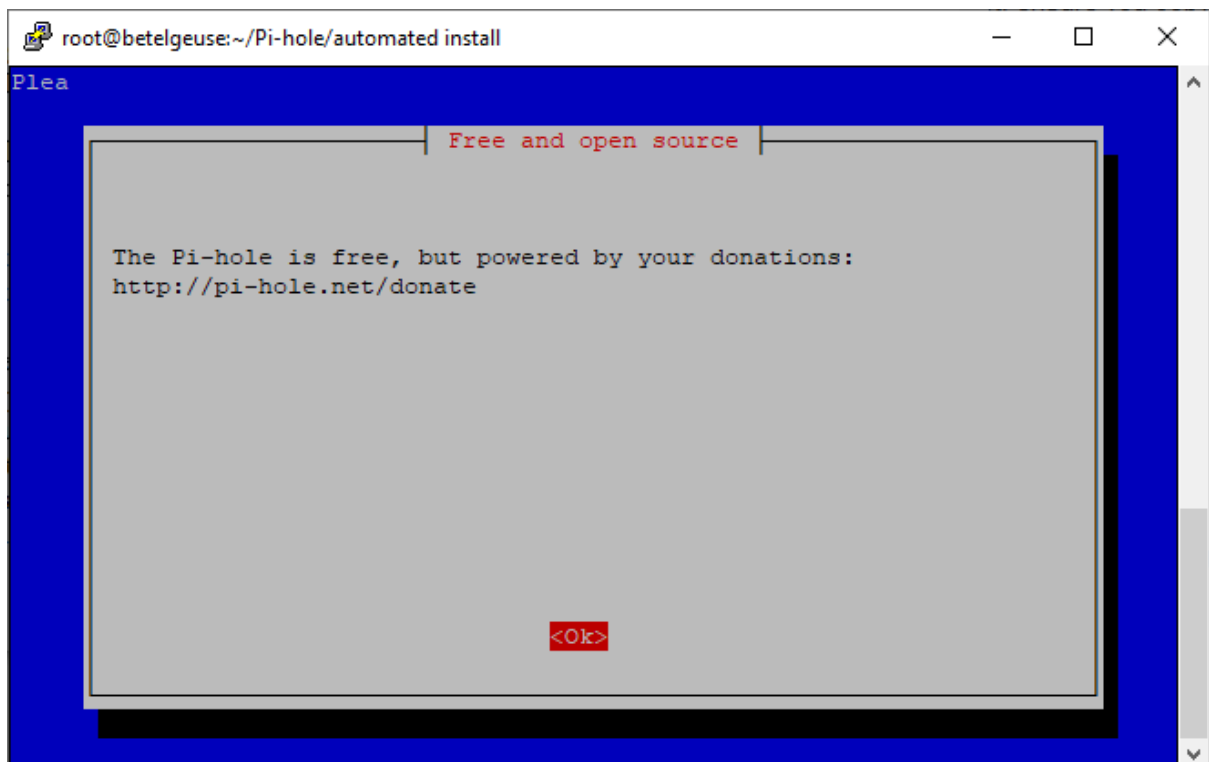
### 3. Install Pi-Hole

```
# git clone --depth 1 https://github.com/pi-hole/pi-hole.git
Pi-hole
# cd "Pi-hole/automated install/"
# sed -i "s/lighttpd\slighttpd-fastcgi//" basic-install.sh
# chmod +x basic-install.sh
# ./basic-install.sh
```

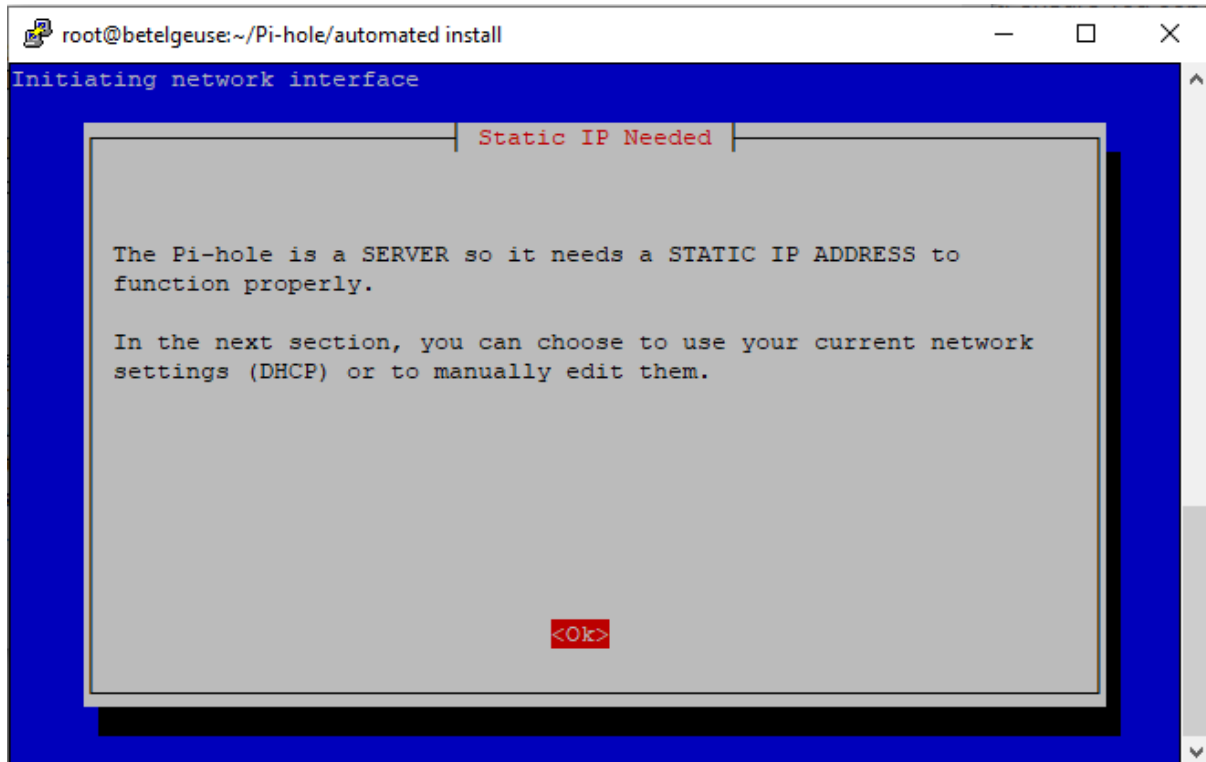
[illegible]



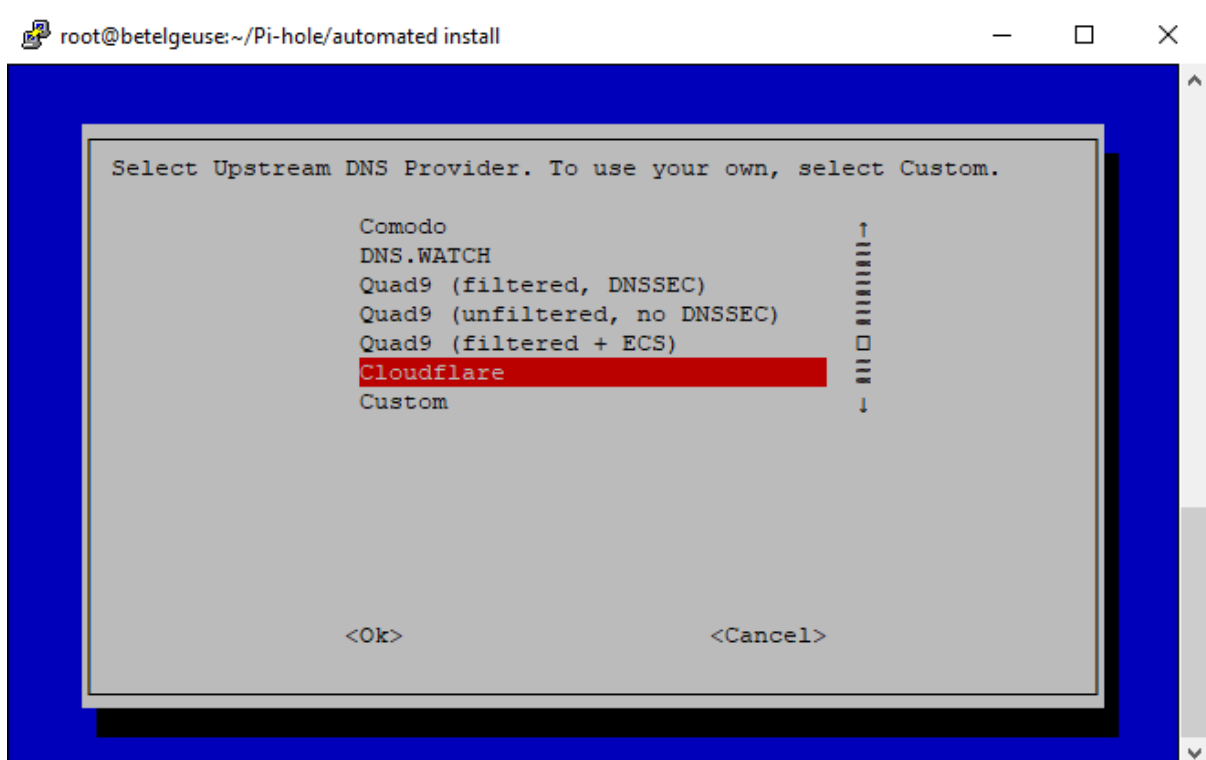
OK [Enter]



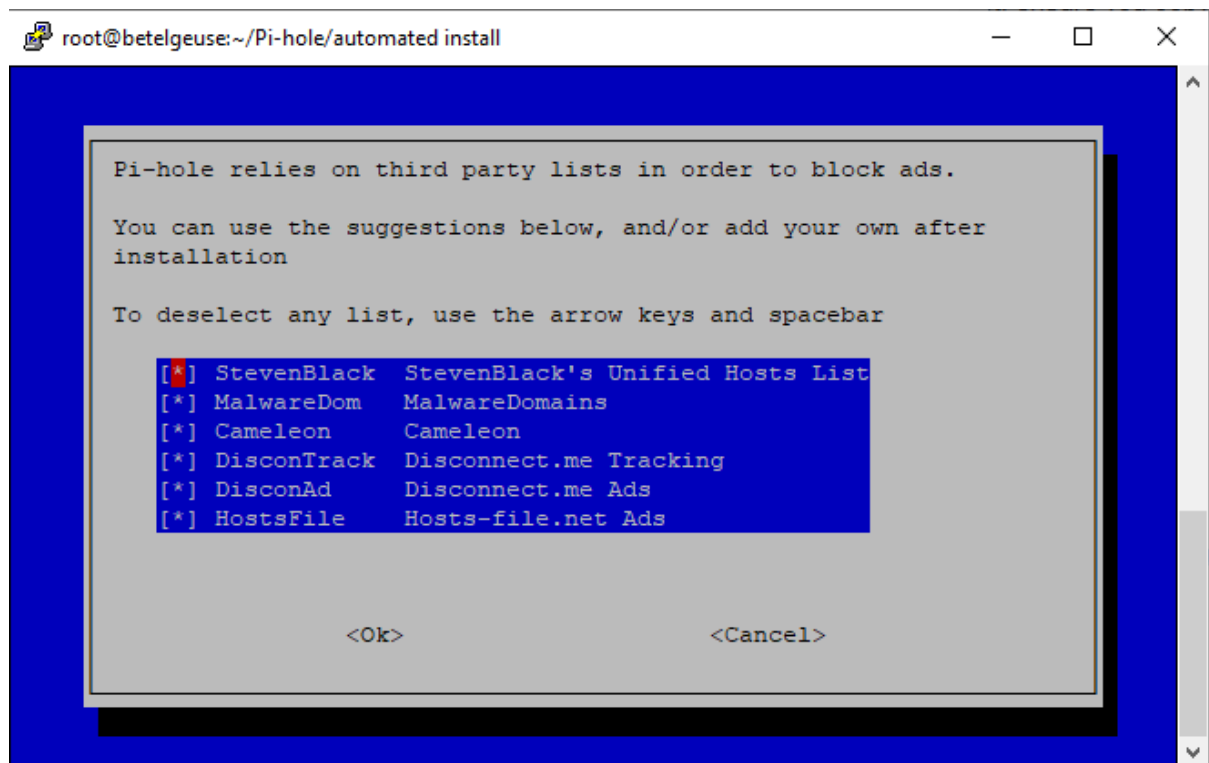
OK [Enter]



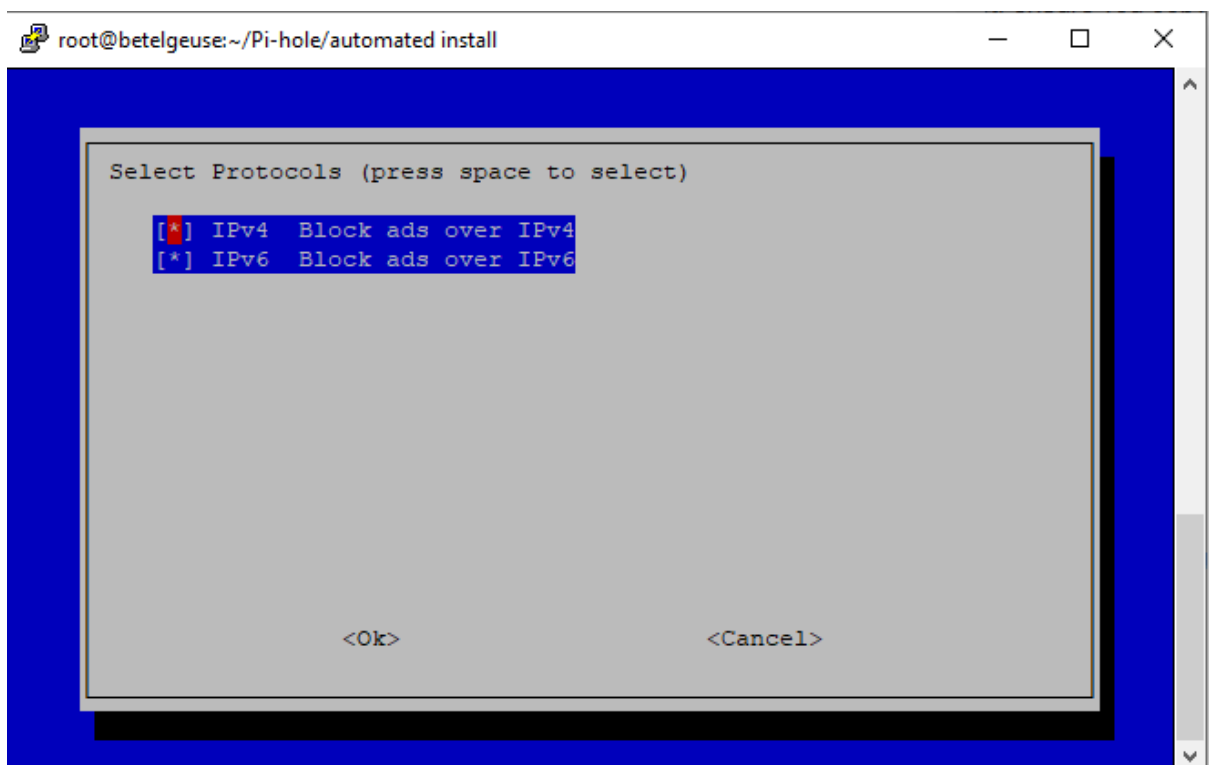
OK [Enter]



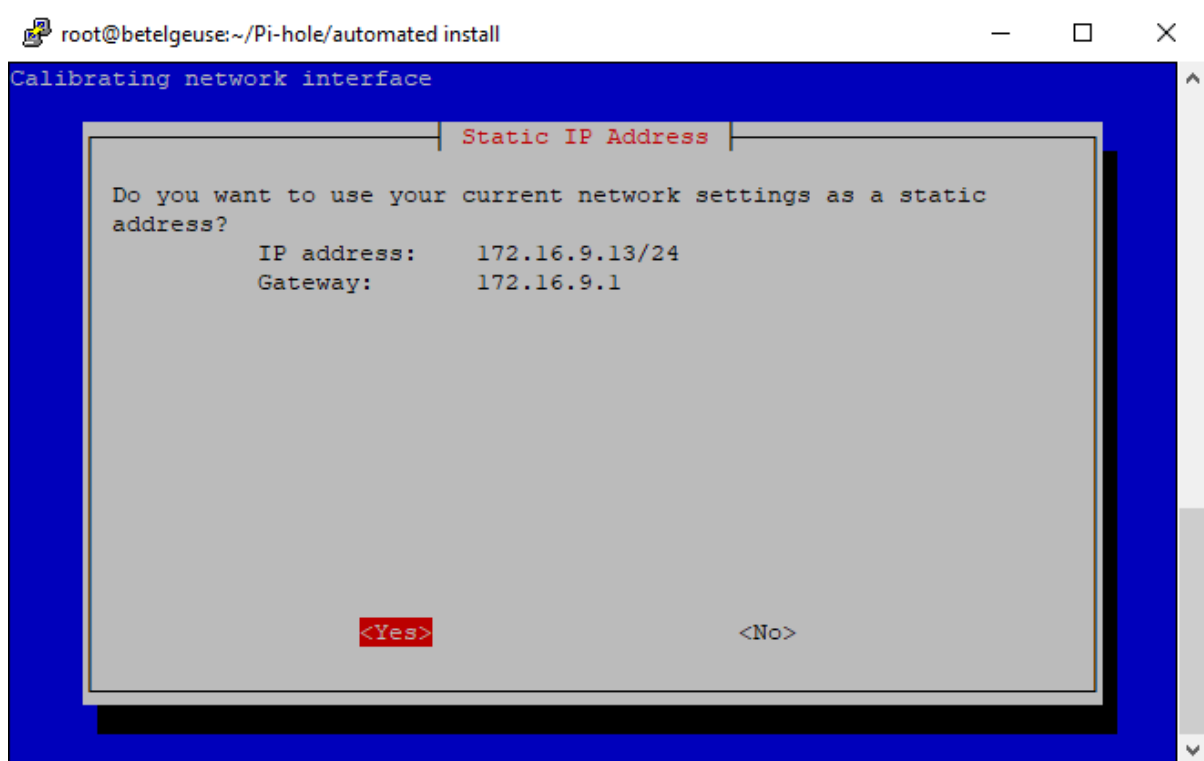
Select your upstream DNS Provider. If you have your own DNS Server, you can choose custom and set your IP DNS Server. In this modul, I choose Cloudflare.



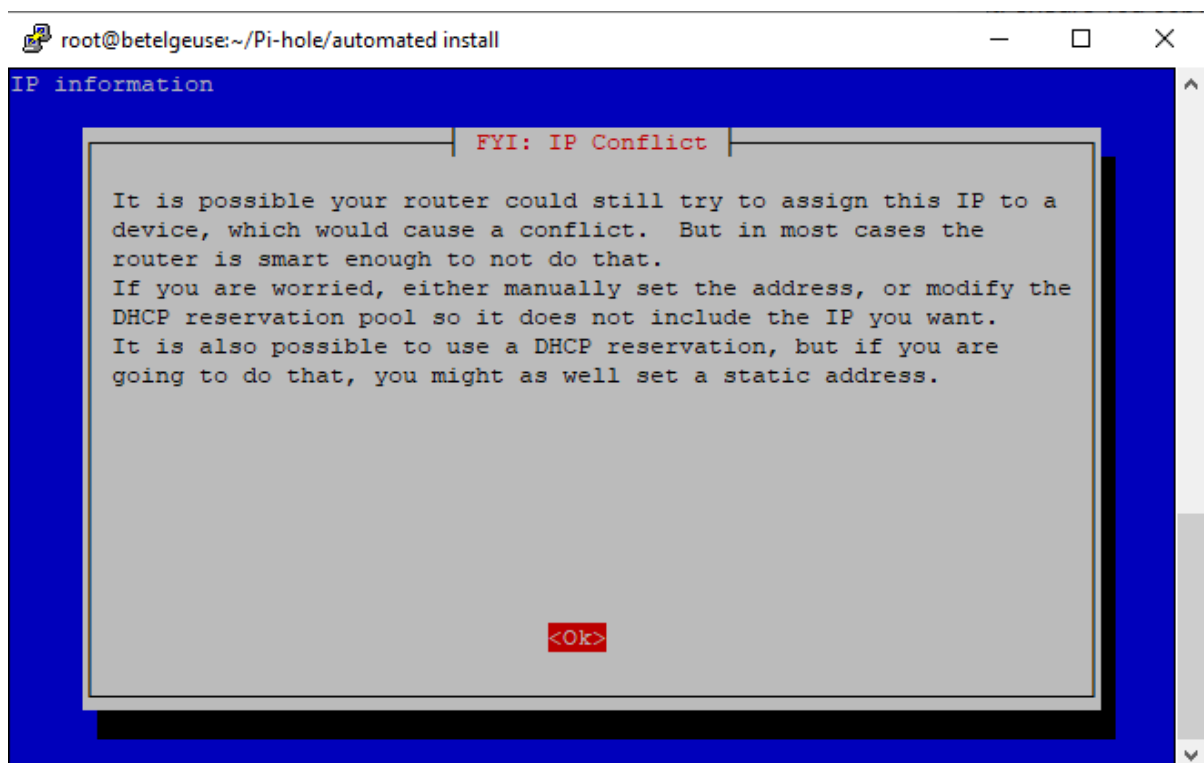
Select domain blacklist source. You can select/deselect with press [Space].



Select or deselect protocols.

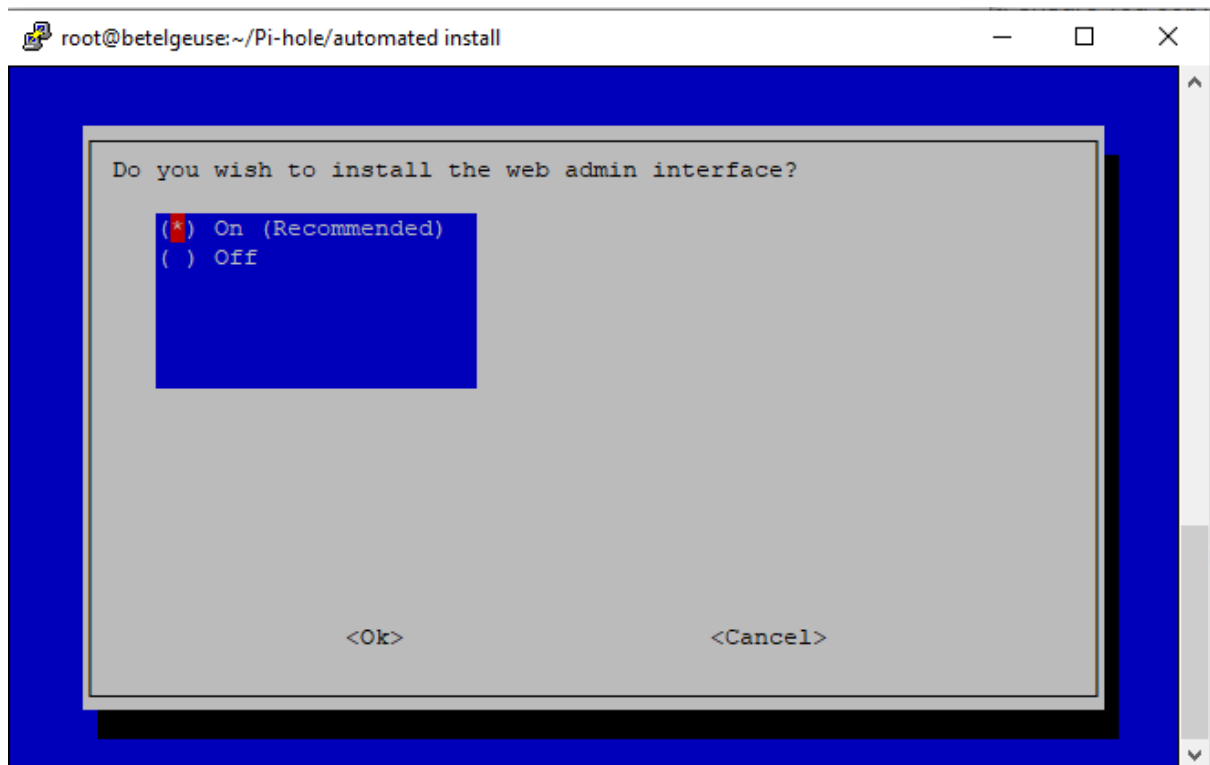


Making your server's IP as a static IP Address. [Yes]

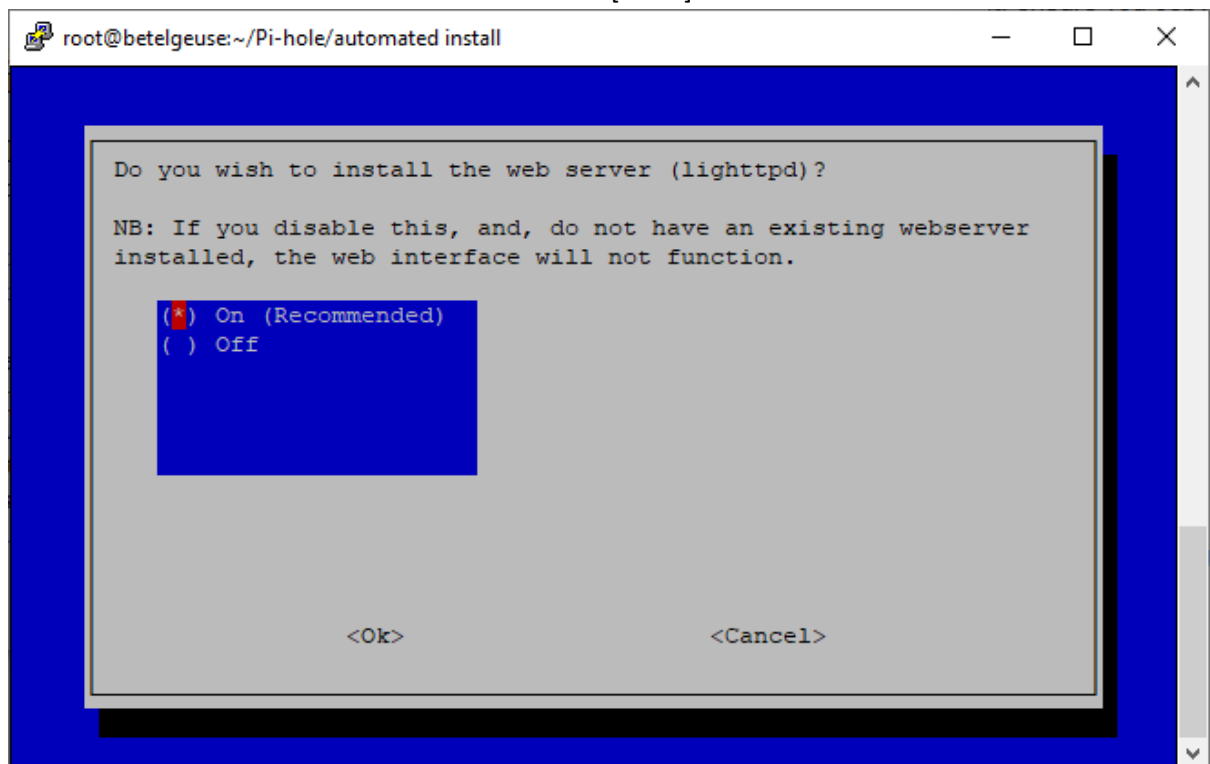


Warning possibility of IP conflict. Make sure your server's IP not used by another device. Ok [Enter]

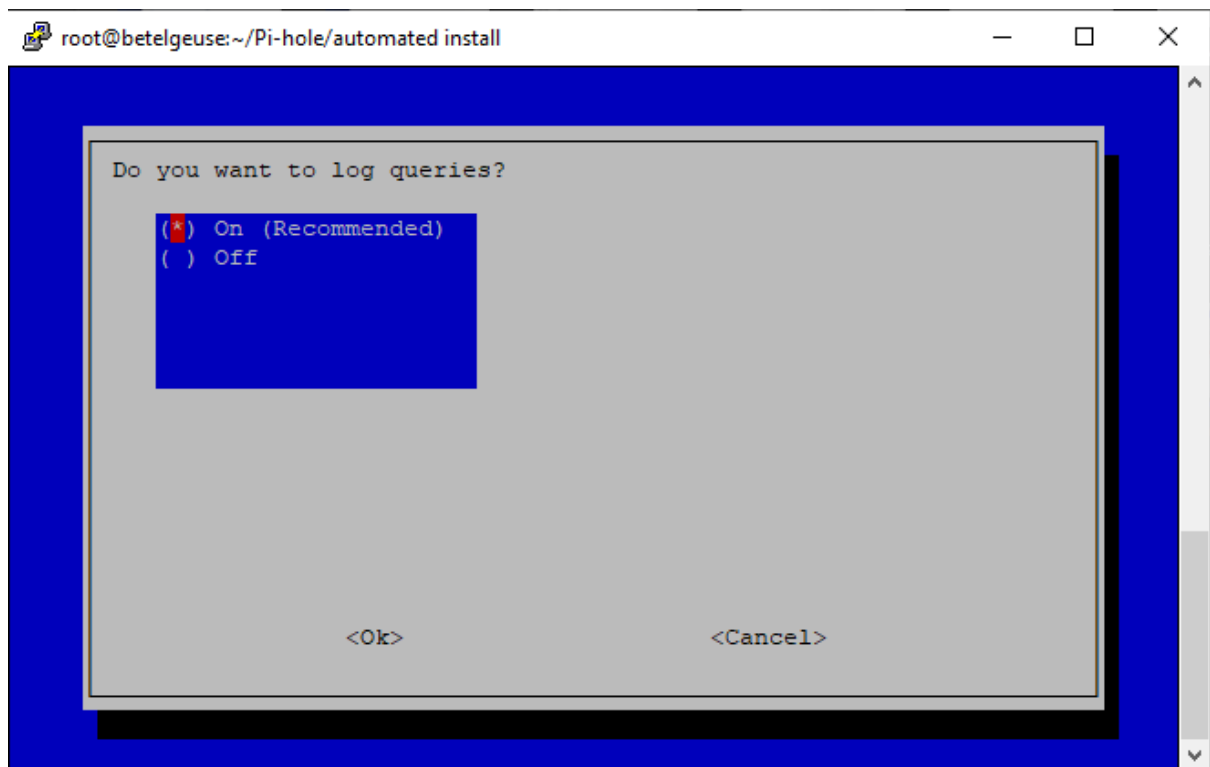




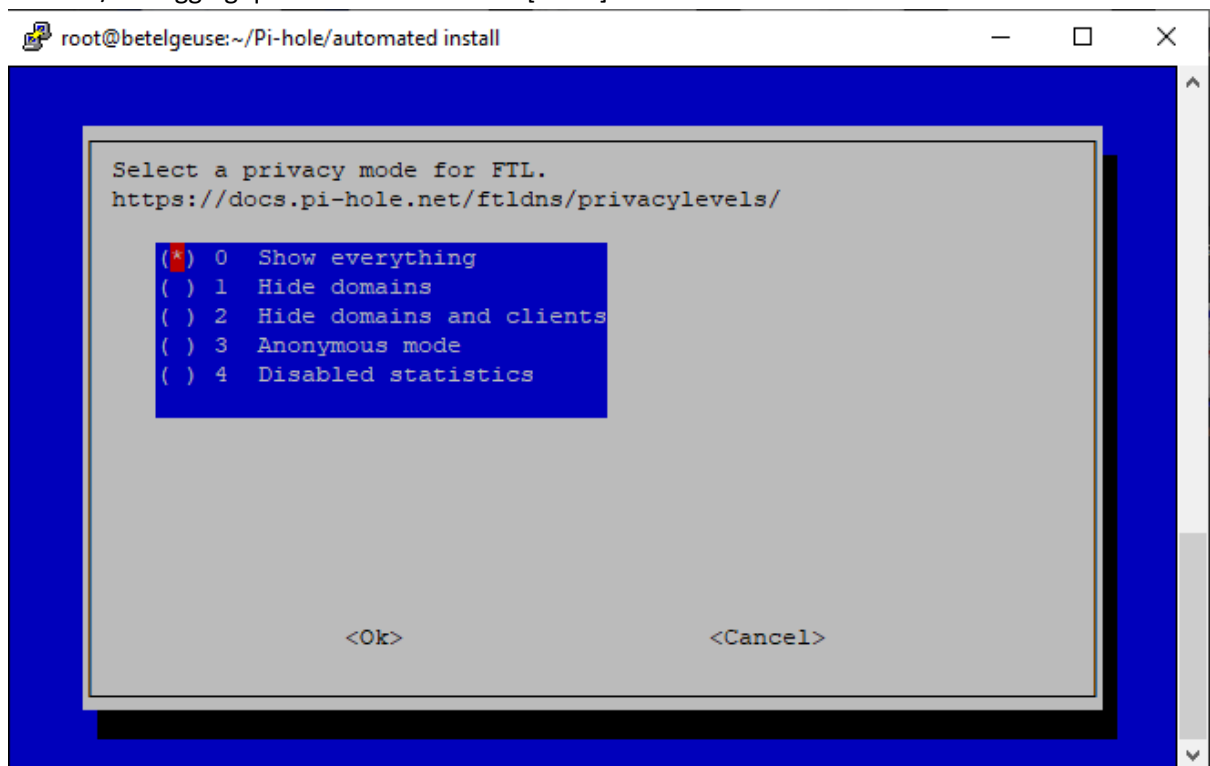
Disable or Enable Admin Interface. Default On. Ok [Enter]



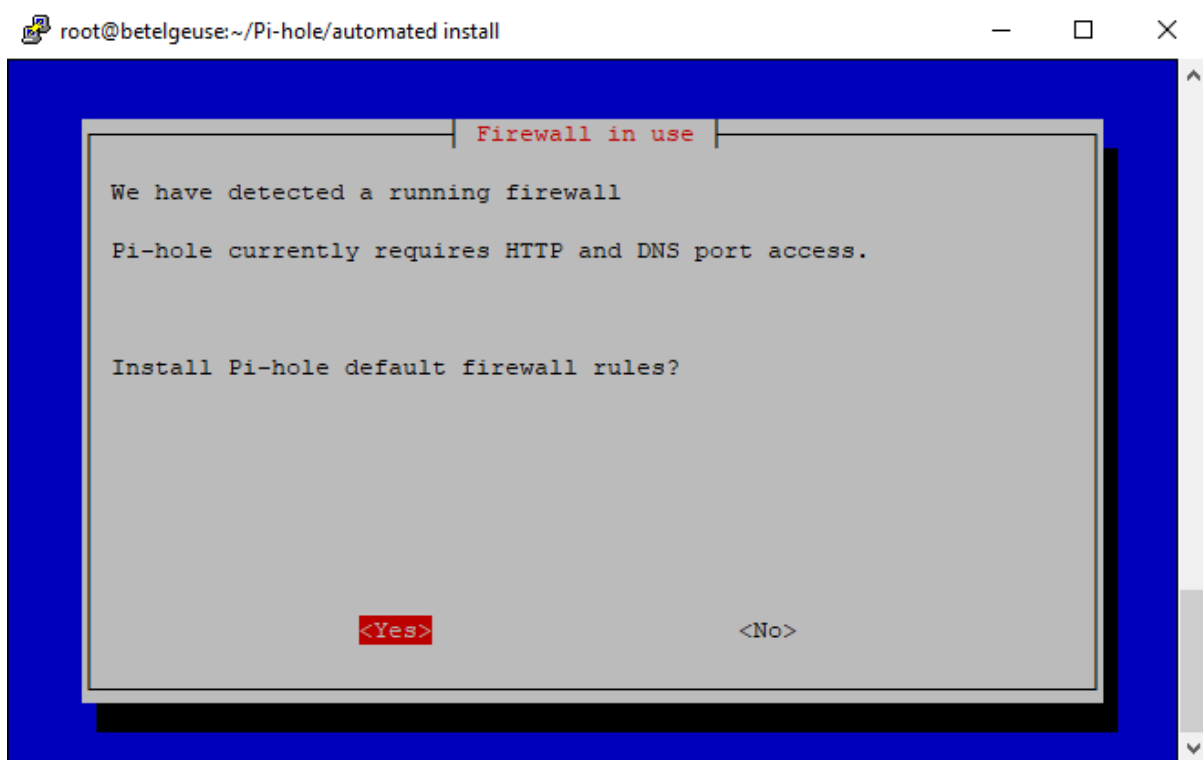
Enable lighttpd, Choose On. Ok [Enter].



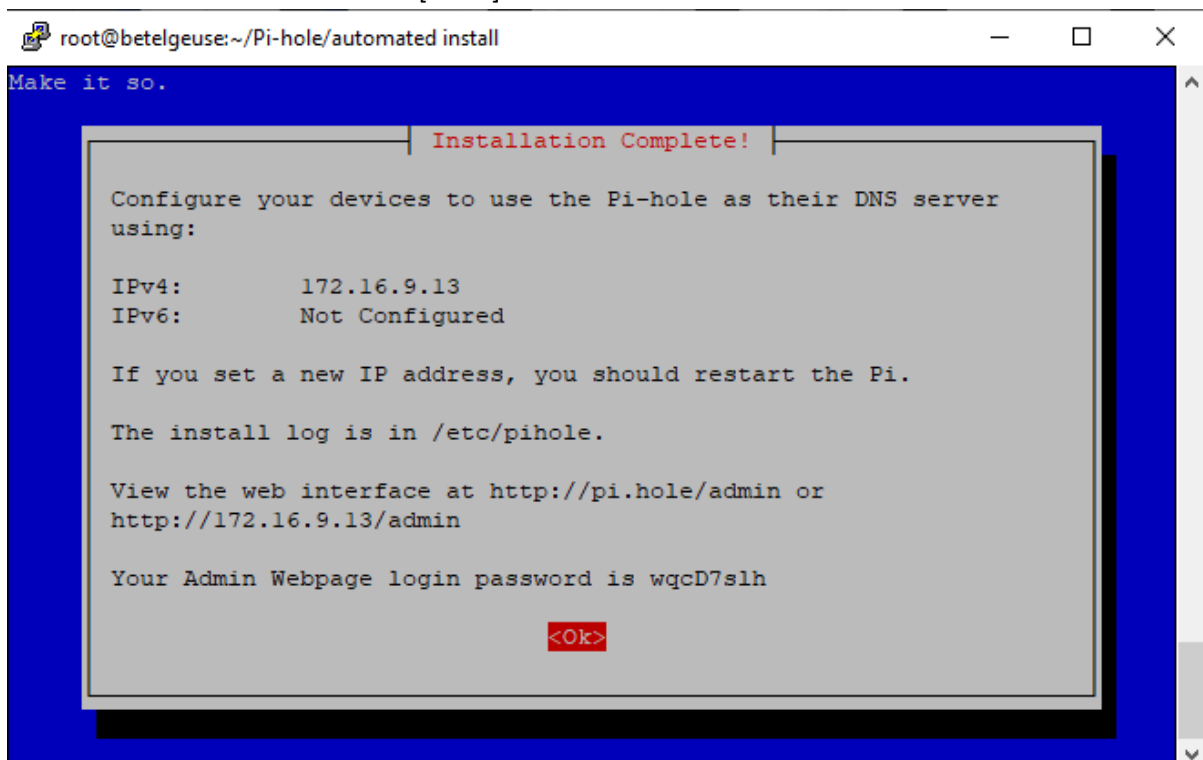
Turn on/off logging queries. Default on. Ok [Enter].



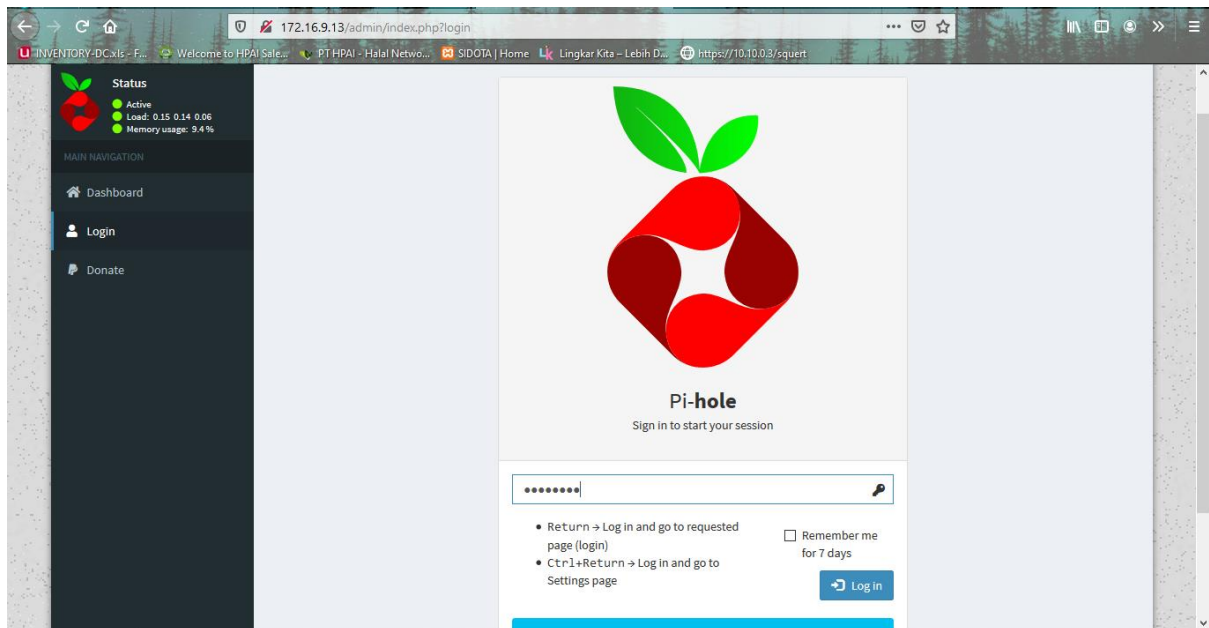
Choose your privacy level for client. Use [Space] for select option. Ok [Enter].



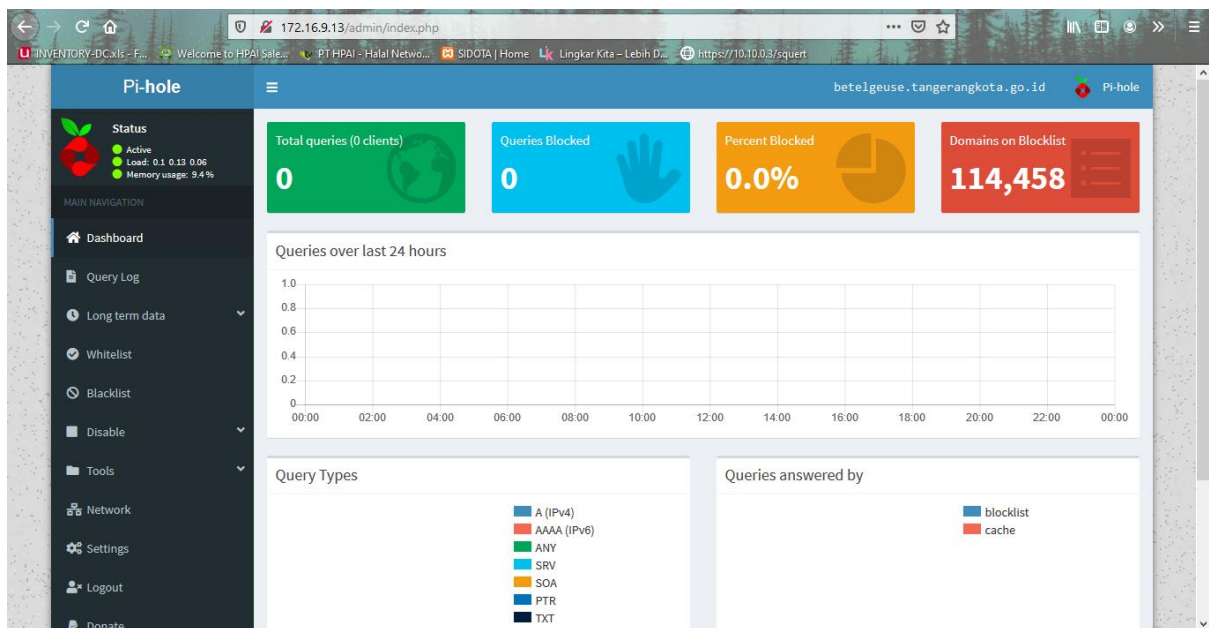
Enable Pi-hole default firewall. Ok [Enter].



Installation Complete. Noted your Pi-hole admin interface password.



Open your Pi-hole Server's IP in browser. In this module, my Pi-hole admin address is <http://172.16.9.13/admin>. And login with your password.



Pi-Hole dashboard interface.