

CYBR 4423

Unix/Linux Administration

Network Admin

Basic Network Admin

Configure host and network settings

- Check network card and IP information

- Configure network card and IP address

- Activate/deactivate network card

- Renew IP address

Tools

- Gnome NetworkManager (nm)

- ifconfig

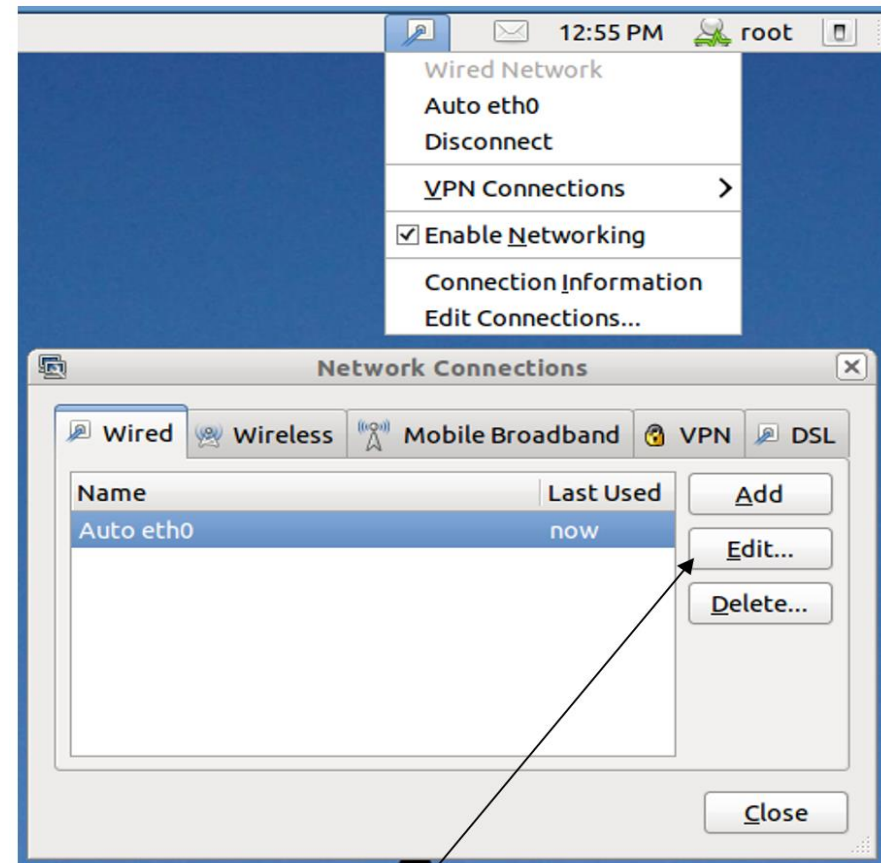
- iproute2 (ip)

- dhclient

- hostname

Gnome NetworkManager (1)

Click: the network icon on the top panel and then select "Edit Connections"



Click the "Edit" button to configure a wired NIC

Or: execute `nm-connection-editor` command in the terminal emulator to bring up the window.

Gnome NetworkManager (2)

You can

- change the name of the connection

- View MAC address

- Configure IP settings

 - DHCP or

 - Static

Editing Auto eth0

Connection name: Auto eth0

☒ Connect automatically

Wired 802.1x Security IPv4 Settings IPv6 Settings

Method: Automatic (DHCP)

Addresses

Address	Netmask	Gateway
---------	---------	---------

Add

Delete

DNS servers:

Search domains:

DHCP client ID:

☒ Require IPv4 addressing for this connection to complete

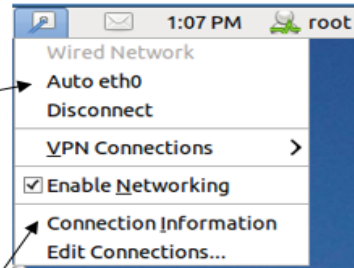
Routes...

☒ Available to all users

Cancel Save...

Other Tools

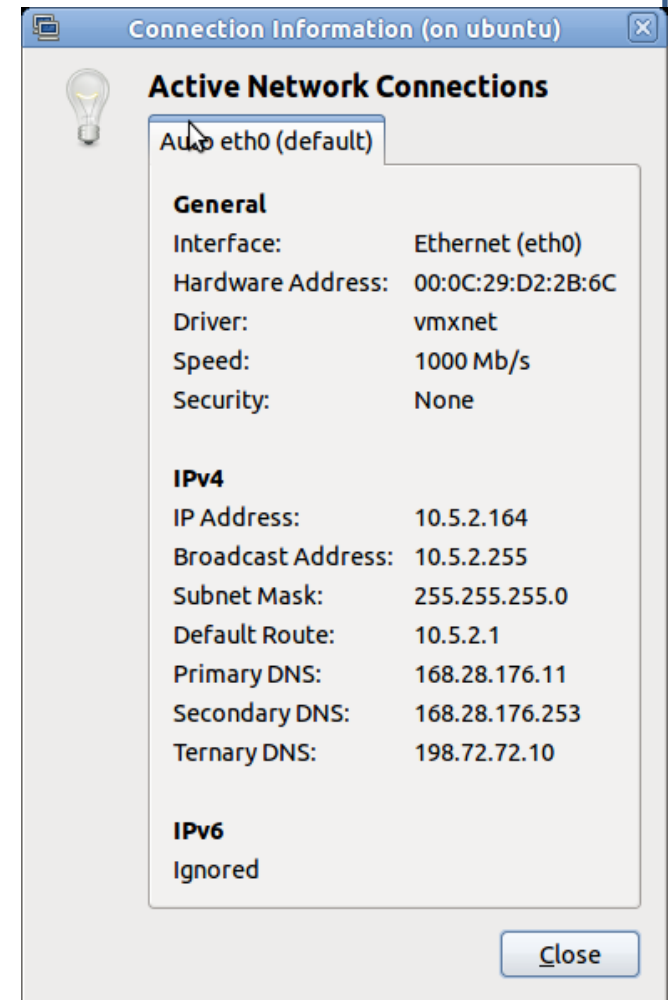
Connect, disconnect, or renew the connection.



Select this item to view current network connection information

nm-tool

This console utility also provides information about device and connection information



Network Manager CLI (nmcli)

nmcli is a command-line tool for controlling NetworkManager and getting its status.

The main nmcli's usage is on servers, headless machines, and scripting, or just for power users who prefer the command line.

Usage

Check NetworkManager status

```
nmcli nm
```

Control NetworkManager connections

```
nmcli con
```

```
nmcli con up id "Auto eth0"
```

```
nmcli con down id "Auto eth0"
```

Management devices

```
nmcli dev
```

```
nmcli dev list
```

Visit the following page for complete reference

[Ubuntu Manpage](#)



ifconfig

ifconfig (interface configuration) is a command line network admin tool in Unix-like systems to query, configure and control TCP/IP network interface cards

Usage

Display current device information

```
ifconfig
```

Activate/deactivate a network card and connection

```
ifconfig eth0 up
```

```
ifconfig eth0 down
```

iproute2

Iproute2 is a collection of utilities for controlling TCP/IP networking and traffic control in Linux

Basic usage to check IP address

ip addr

ip route

Reference

[IPROUTE2 Utility Suite Howto](#)

[Iproute2](#)

"ifconfig" and "ip addr" Output

An interface for a network card. The IP address is assigned dynamically.

A loopback interface, only used internally, using IP 127.0.0.1 to 127.255.255.254

```
root@ubuntu:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0c:29:d4:4e:df
          inet addr:192.168.52.132  Bcast:192.168.52.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fed4:4edf/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:90484 errors:0 dropped:0 overruns:0 frame:0
          TX packets:12535 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:21068714 (21.0 MB)  TX bytes:911192 (911.1 KB)
          Interrupt:19 Base address:0x2024
```

```
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:1265 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1265 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:80109 (80.1 KB)  TX bytes:80109 (80.1 KB)
```

```
root@ubuntu:~# ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 16436 qdisc noqueue state UNKNOWN
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
    state UP qlen 1000
    link/ether 00:0c:29:d4:4e:df brd ff:ff:ff:ff:ff:ff
    inet 192.168.52.132/24 brd 192.168.52.255 scope global eth0
    inet6 fe80::20c:29ff:fed4:4edf/64 scope link
        valid_lft forever preferred_lft forever
root@ubuntu:~#
```

dhclient

dhclient is a client of DHCP (Dynamic Host Configuration Protocol)

Usage

Renew IP address

`dhclient eth0`

Release IP

`dhclient -r`

Host Name Configurations

hostname

This command displays or changes the name of the current computer (host).

```
#> hostname
```

Usage

Display current hostname

```
#> hostname new-host-name
```

Change hostname (this change is in effect until next computer restart)

/etc/hostname

/etc/hostname

This is the file where hostname is stored. To change the hostname permanently, change the name in this file and then restart the computer.

To change the hostname permanently without reboot

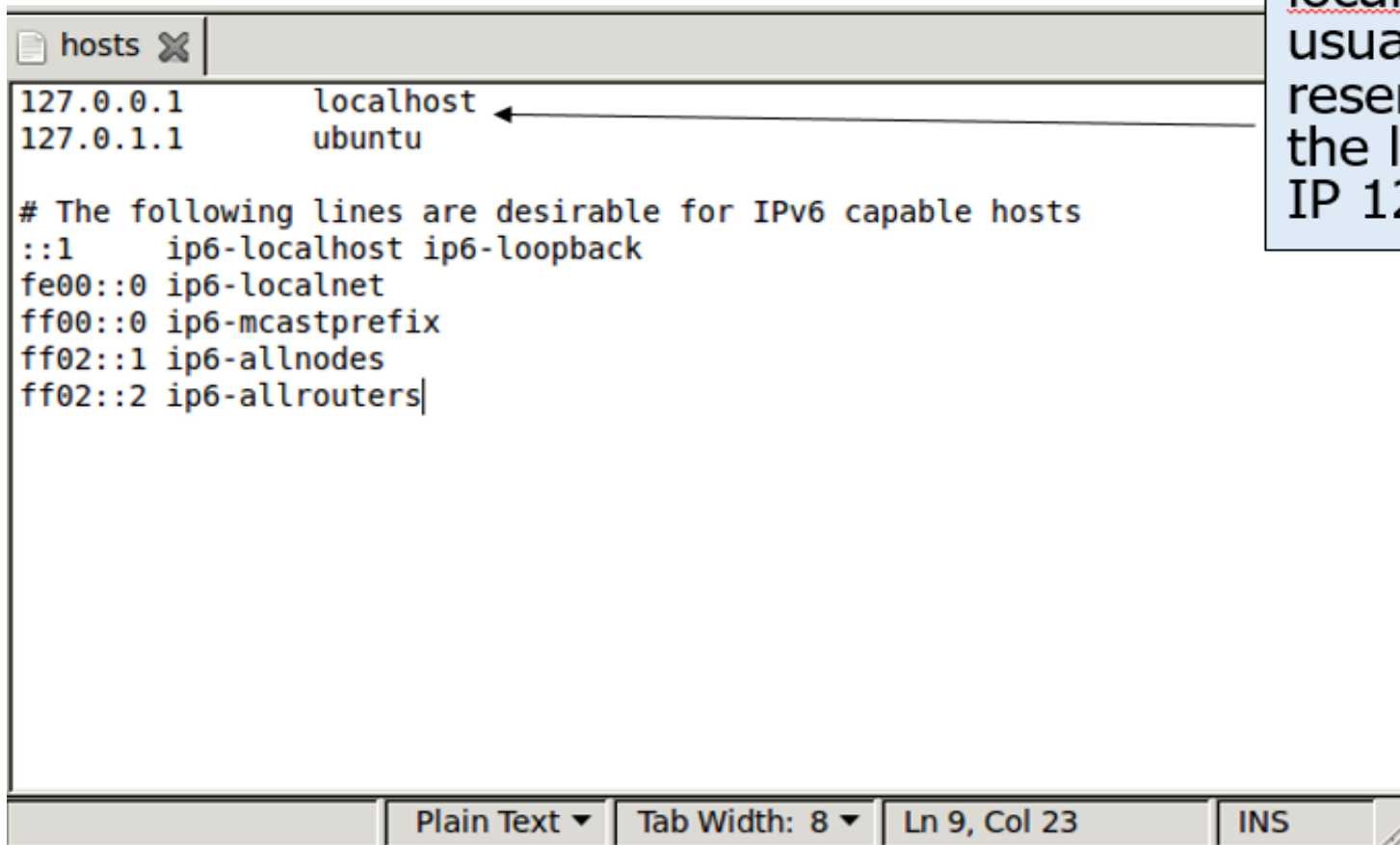
First change the /etc/hostname file, then

```
#> /etc/init.d/hostname start
```

```
#> service hostname start
```

/etc/hosts

This file provides a local mapping of IP and host/domain names



A screenshot of a text editor window showing the contents of the /etc/hosts file. The window has a title bar with 'hosts' and a close button. The text inside the editor is as follows:

```
127.0.0.1    localhost
127.0.1.1    ubuntu

# The following lines are desirable for IPv6 capable hosts
::1          ip6-localhost ip6-loopback
fe00::0      ip6-localnet
ff00::0      ip6-mcastprefix
ff02::1      ip6-allnodes
ff02::2      ip6-allrouters
```

The status bar at the bottom of the editor shows 'Plain Text', 'Tab Width: 8', 'Ln 9, Col 23', and 'INS'.

localhost is usually reserved for the loopback IP 127.0.0.1

Querying Hosts and Domains

Command line tools

ping
host, dig
whois

GUI

Gnome-nettool

ping

Ping is used to test the reachability of a host on an IP network and to measure the round-trip time for messages sent from the originating host to a destination computer.

It can also be used to determine the IP address of a host

Usage

ping [host]

Use ctrl+c to stop pinging

Option -c: number of pinging

#> ping kennesaw.edu

#> ping kennesaw.edu -c 5

host

host is a simple utility for performing DNS lookups.

It is normally used to convert names to IP addresses and vice versa.

Usage

Query IP addresses from domain

Query Domain via IP address

>host it.Kennesaw.edu

>host 168.28.176.243

dig

dig is another utility for performing DNS lookups similar to host

Usage

Query IP addresses from domain

Query Domain via IP address

>dig it.kennesaw.edu

>dig 168.28.176.243

whois

WHOIS is a protocol that is used for querying the registered users or assignees of an Internet resource, such as a domain name

ICANN.org is a website for such queries:

Usage in Linux

Whois [host name]

whois kennesaw.edu

ICANN | LOOKUP

Registration data lookup tool

Enter a domain name or an Internet number resource (IP Network or ASN) [Frequently Asked Questions \(FAQ\)](#)

Lookup

By submitting any personal data, I acknowledge and agree that the personal data submitted by me will be processed in accordance with the ICANN [Privacy Policy](#), and agree to abide by the website [Terms of Service](#) and the [registration data lookup tool Terms of Use](#).

Domain Information

Name: GOOGLE.COM

Registry Domain ID: 2138514_DOMAIN_COM-VRSN

Domain Status:

[clientDeleteProhibited](#)

[clientTransferProhibited](#)

[clientUpdateProhibited](#)

[serverDeleteProhibited](#)

[serverTransferProhibited](#)

[serverUpdateProhibited](#)

Nameservers:

NS1.GOOGLE.COM

NS2.GOOGLE.COM

NS3.GOOGLE.COM

NS4.GOOGLE.COM

Dates

Registry Expiration: 2028-09-14 04:00:00 UTC

Updated: 2019-09-09 15:39:04 UTC

Created: 1997-09-15 04:00:00 UTC

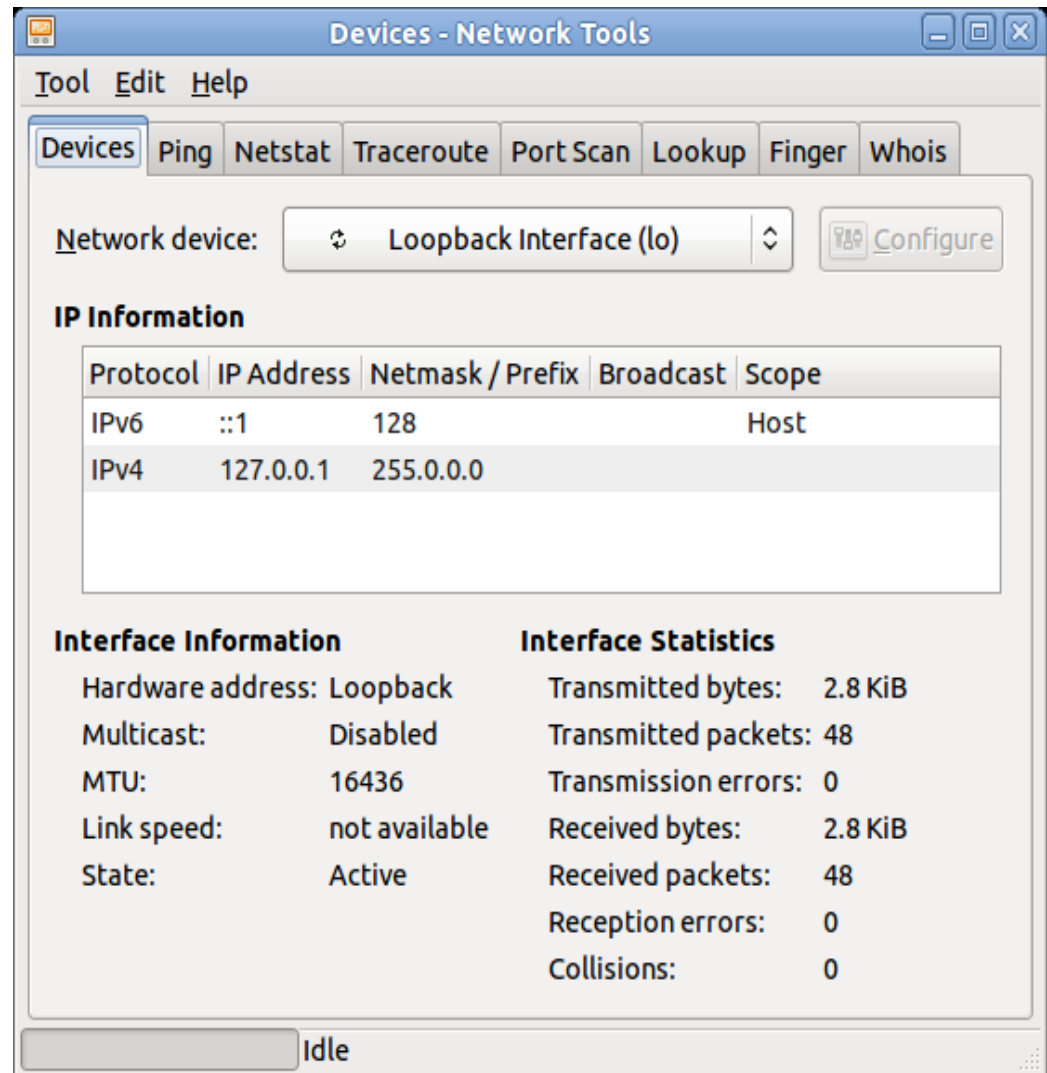


Gnome Network Tool

gnome-nettool

This is a GUI tool that combines several network utilities mentioned earlier

Type "gnome-nettool" in the terminal to start the GUI tool



inet

The inetd (Internet daemon) daemon and its replacement xinetd (extended Internet daemon; xinetd.org) are called superservers or service dispatchers

It starts other daemons, such as smbd (Samba) and vsftpd (FTP), as necessary.

It listens for network connections. When one is made, they identify a server daemon based on the port the connection comes in on and start the daemon.

Service port file

/etc/services



Network File Sharing

Setting up a file server (storage on the network) is a common service on the local network

Options

- NFS for Linux machines

- Samba between Windows and Linux

Mount a Windows Shared Drive

Download and install smbfs

```
apt-get install smbfs
```

Create a mounting point (directory) using the "mkdir" command

```
#> mkdir /cse-share
```

Use the "smbmount" or the "mount" command

```
#> smbmount //csedata/facultyshared /cse-share -o user=jzheng3
```

May use IP address instead of hostname

Modify the /etc/fstab to auto-mount it

Summary

Commands and utilities

ifconfig, ip
nm-tool, nmcli
dhclient
hostname
ping
host, dig
whois

GUI

Gnome NetworkManager (nm-applet)
Gnome Net Tools (gnome-nettool)

Good Readings and Resources

[NetworkManager](#)

[More about Samba](#)