Linux Administration Part 2

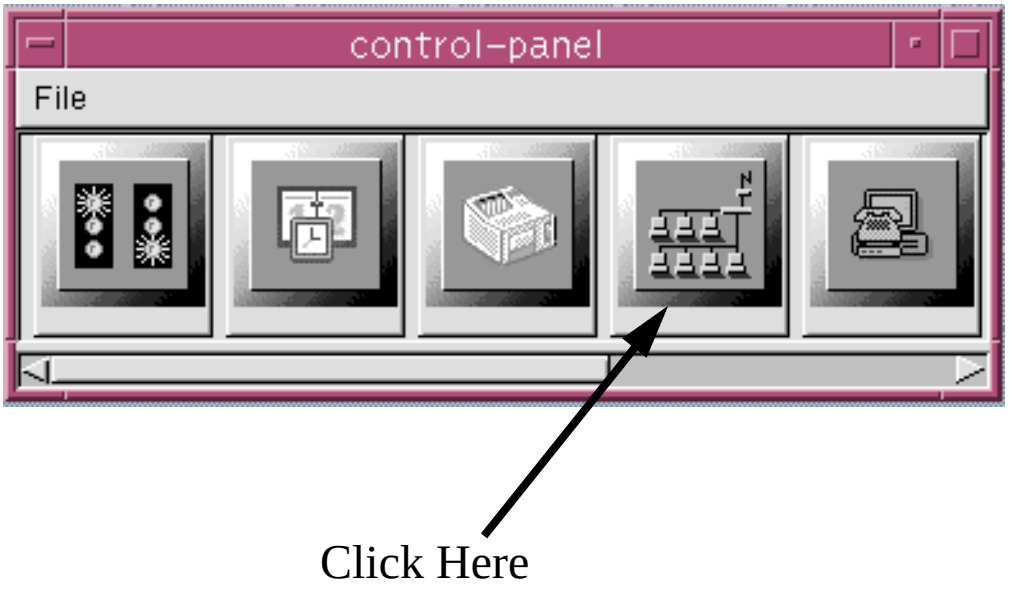
IP Routing - How to set up a router

- Our machine now has two active interfaces, but will not yet route.
- We can set up routes in two ways:-
    * **Dynamic routing**. This requires a daemon called *routed* to be started at boot time.
    * **Static routing**. This requires a file to be edited to add fixed routes, which will be read at boot time.
- The first option *routed* is the easiest, but least secure.
- The second option is the more secure but involves more work.
- We'll look at setting up static routing first, then take a look at *routed*.
- Static routing can be set up using *control-panel* or *linuxconf*, as well as editing files manualy.
- The section will show the use of *control-panel*, plus the files which are edited as a result, but by all means have a look at *linuxconf* as well.

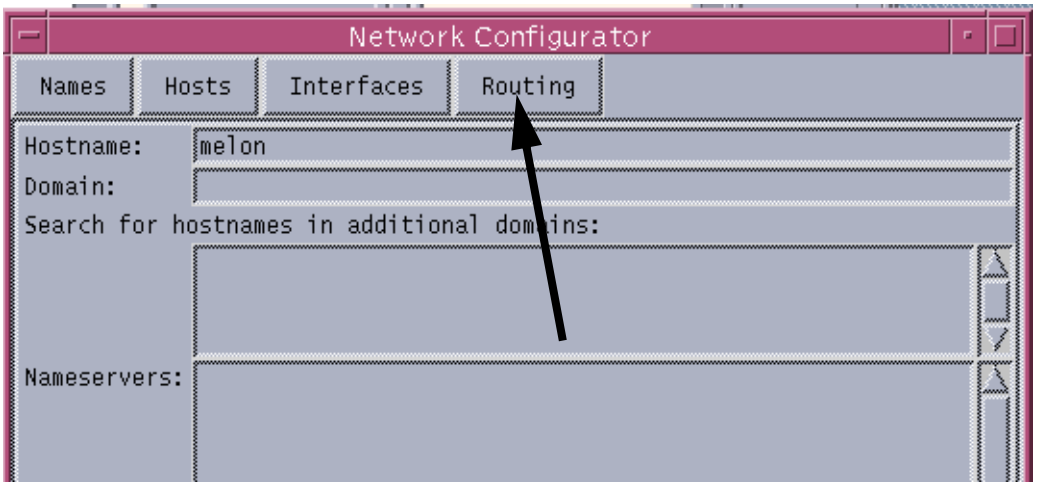
Linux Administration Part 2

IP Routing - Configuring a router using a GUI

- Under *control-panel*, click on the Network Configuration icon to see the routing options:-



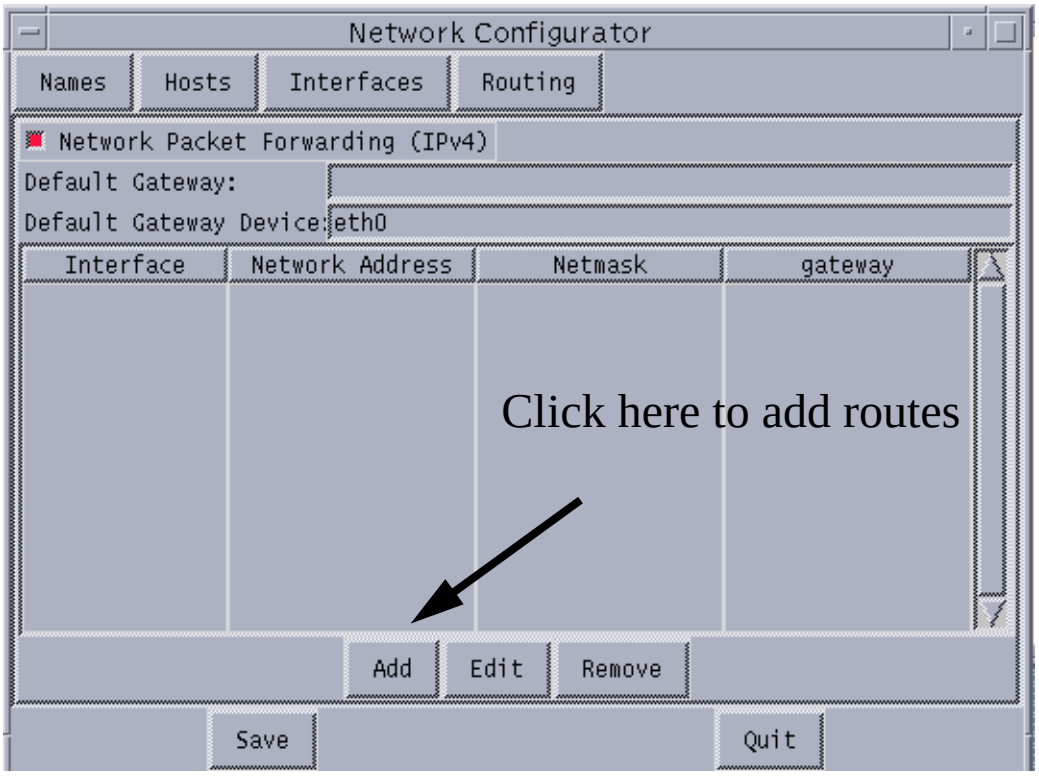
- On the next screen click on *Routing*:-



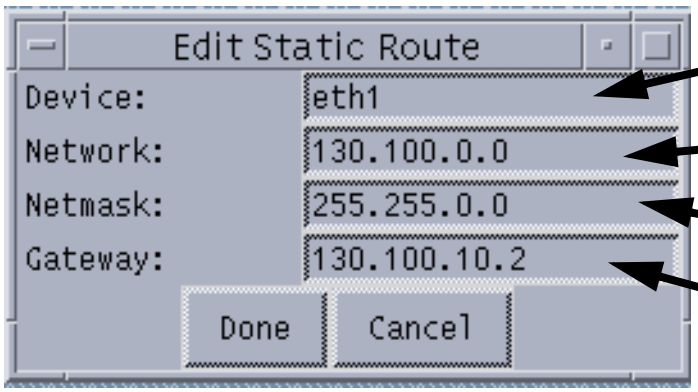
- .. and you will see the Routing configurator.

Linux Administration Part 2

IP Routing - Configuring a router using a GUI



- The screen shows current routes; use *Add* to define more:-



The interface

The network it connects to.

The netmask

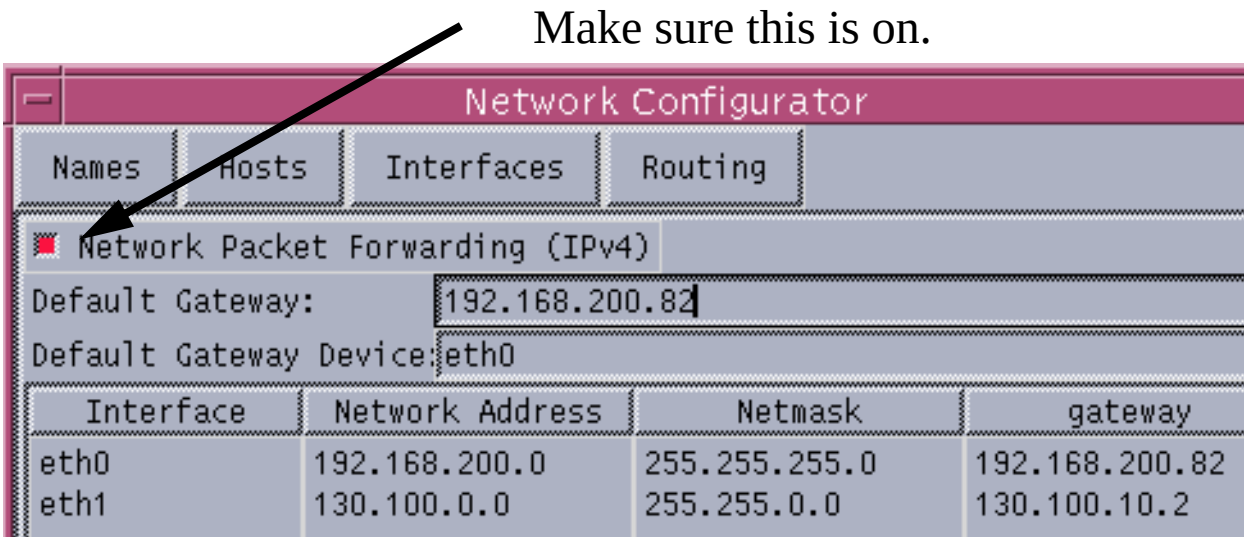
The IP address of the router on that network

- This example router has two interfaces:-
  - eth0 - connected to network 192.168.200.0 with IP address 192.168.200.82
  - eth1 - connected to network 130.100.0.0 with IP address 130.100.10.2

Linux Administration Part 2

IP Routing - Configuring a router using a GUI

- We would therefore need two routes as follows:-



- These routes are written to */etc/sysconfig/static-routes*, which looks like this:-

more /etc/sysconfig/static-routes

eth1 net 130.100.0.0 netmask 255.255.0.0 gw 130.100.10.2
eth0 net 192.168.200.0 netmask 255.255.255.0 gw 192.168.200.82

- To ensure that the routes are correctly activated, the machine should ideally be rebooted.
- Check also that IP Forwarding (routing) has been turned on; to do this, check the file */etc/sysconfig/network*:-

NETWORKING=yes
FORWARD_IPV4=yes
HOSTNAME=melon
DOMAINNAME=
GATEWAY=130.100.10.2
GATEWAYDEV=eth0
etc..

Linux Administration Part 2

IP Routing - Configuring non-router machines

- The router should now pass packets between the two networks.
- However, the other machines on the two networks do not know that the machine is a router, so we need to set them up also.
- Again, there is more than one way.
    * **Static routing.**
    * **Dynamic routing** - we can start *routed* on a machine in enquiry mode, where it will use RIP (Router Information Protocol) to find out about available routes when it needs them.
- Static routing has various options:-
    * We can tell the machines which is the route to a certain network or networks,.
    * We can set up a default gatetway where all packets for other networks are sent.
    * We can have a combination of specific routes and a default for those that are not specified.

Linux Administration Part 2

IP Routing - Configuring non-router machines

- Here's the *route* command being used on a machine which:-
    * Is on network 192.168.200.0
    * Has access to the router 192.168.200.82 which we just set up.
    * Requires access to machines on network 130.100

```
# route add -net 130.100.0.0 netmask 255.255.0.0 \
        gw 192.168.200.82
```

    * Where *-net 130.100.0.0* is the network it wants to reach.
    * *netmask 255.255.0.0* is that netmask of the 130.100.0.0 network.
    * *gw 192.168.200.82* is the IP address of the ruter which will forward the packets.
- On other versions of UNIX/Solaris, the route command syntax can be different; here is a Solaris example which does exactly the same as above:-

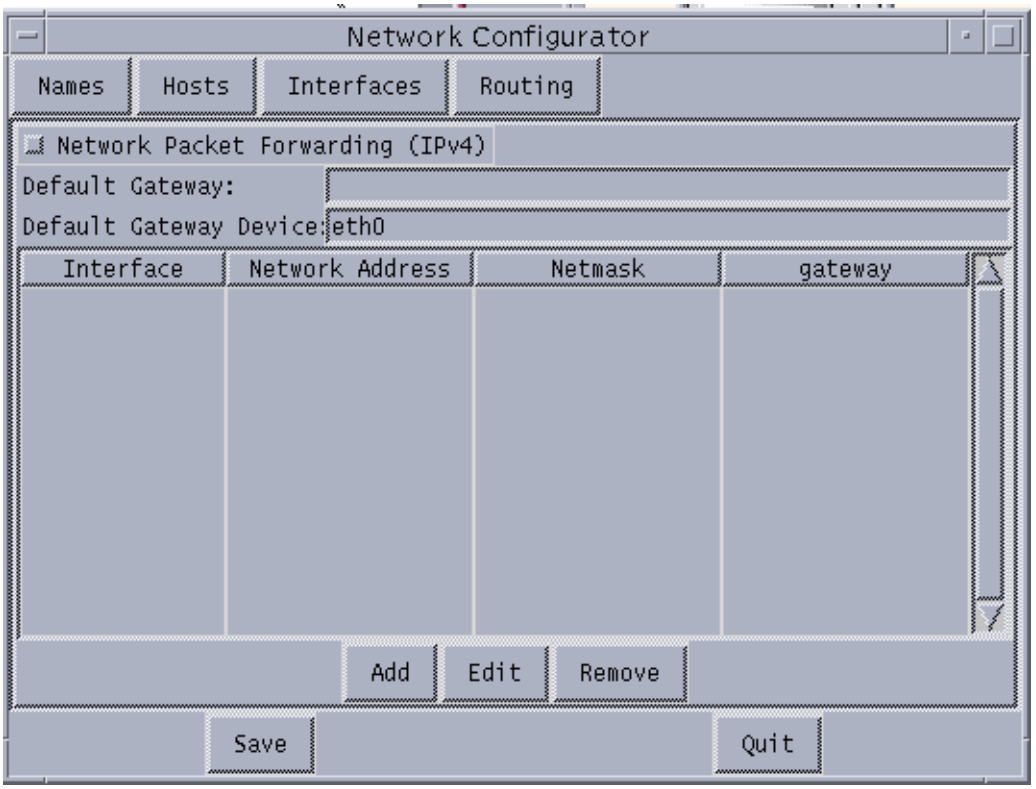
```
# route add net 130.100.0.0 192.168.200.82 1
```

- Of course, you do not want to run the *route* command each time you boot, so use the *control-panel* to set up routes permanently - see next page.

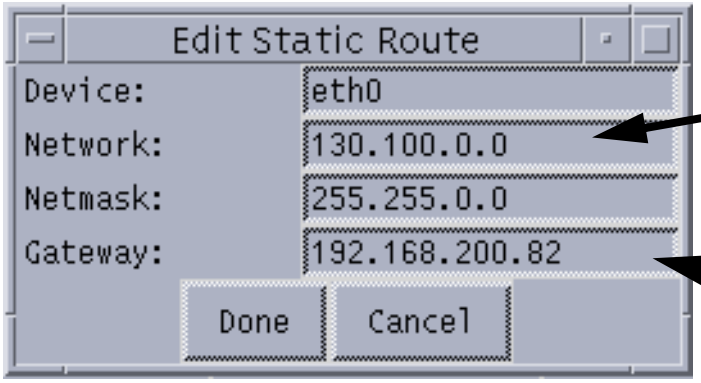
Linux Administration Part 2

IP Routing - Configuring non-router machines

- To set up a permanent route, invoke ***control-panel***, then invoke the Network Configurator:-



- Add a route as follows:-



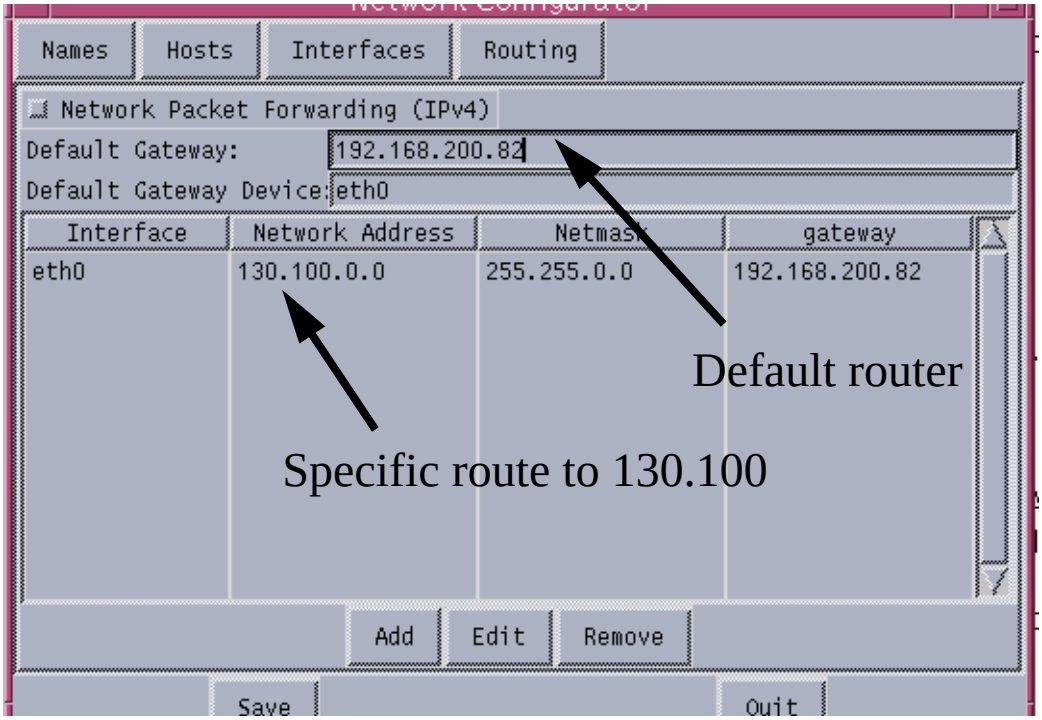
Network

Router which connects to it ("Gateway")

Linux Administration Part 2

IP Routing - Configuring non-router machines

- As it is the only router we may as well make it the defualt gateway as shown:-



- Now Save and Quit.
- The route should now be set up - try *ping* on a machine on the other network.
- The files which are edited by the above actions:-

 # more /etc/sysconfig/static-routes

```
eth0 net 130.100.0.0 netmask 255.255.0.0 gw 192.168.200.82
```

* The static route.

 # grep GATEWAY /etc/sysconfig/network

```
GATEWAY=192.168.200.82
GATEWAYDEV=eth0
```

* The default route.