

REFERENCES

- [1] “Bridging”, [http://en.wikipedia.org/wiki/Bridging_\(Networking\)](http://en.wikipedia.org/wiki/Bridging_(Networking))
- [2] Mark Kriegsman, “ Router, Gateway, Proxy, Cache”, ClearWay Technologies
- [3] James Aweya, “IP Router Architectures: An Overview”, Nortel Networks, Ottawa, Canada
- [4] “Routers and Gateway”, <http://www.cs.utk.edu>
- [5] Mark Kriegsman, “ Router, Gateway, Proxy, Cache”, ClearWay Technologies
- [6] “Numerous Routers”, <http://www.cisco.com>
- [7] Kaleem Imran, “The Linux Router”, 2002
- [8] “OSI Model”, <http://www.ethernet.industrial-networking.com>
- [9] “OSI References and Layers”, <http://www.webopedia.com>
- [10] K. Washburn, J.T. Evans, “TCP/IP running a successful network”, 2nd ed. Imprint Wokingham, England Reading, Mass., Addison-Wesley, 1993
- [11] “IP Address”, <http://en.wikipedia.org/wiki/TCP/ip>
- [12] “Static Vs Dynamic IP addresses”, <http://www.zytrax.com/isp/faqs/static.htm>
- [13] “Dynamic IP address”, http://en.wikipedia.org/wiki/Dynamic_IP_add
- [14] Darrick Addison, “ Setting up a Local Area Network – using Red Hat Linux to connect two or more computers”, ASC Technologies.
- [15] “LAN”, <http://www.en.wikipedia.org/wiki/LAN>
- [16] Michael Palmer, ”Hands-on networking fundamentals”, Imprint Boston, Mass Course Technology , 2006.

- [17] K. Washburn, J.T. Evans, "TCP/IP running a successful network", 2nd ed. Imprint Wokingham, England Reading, Mass., Addison-Wesley, 1993
- [18] James Aweya, "IP Router Architectures: An Overview", Nortel Networks, Ottawa, Canada
- [19] Candace Leiden and Marshall Wilensky, "TCP/IP for dummies / by; foreword by Scott Bradner", 5th ed., Imprint New York, Wiley Pub. , 2003.
- [20] Bruce Hallberg, "Networking : a beginner's guide", 4th ed. Imprint New York, McGraw-Hill/Osborne , 2005.
- [21] John Bass, "Quagga router sets an acceptable pace", Network World
- [22] "Quagga", <http://www.quagga.net>
- [23] "Microsoft Windows NetMeeting", <http://www.ees.nmt.edu/Software/netmeeting.html>
- [24] "LanFlow_Net_Diagrammer", http://www.freedownloadcenter.com/Network_and_Internet/Misc__NetworkingTools/.html
- [25] "LAN scanner", <http://www.famatech.com/products/utilities/lanscanner.php>
- [26] "Network Card", http://en.wikipedia.org/wiki/Network_card
- [27] "Installing Home Network Adapters", <http://tech.yahoo.com/gd/installing-home-network-adapters/153481>
- [28] James Trulove, "Lan wiring : an illustrated network cabling guide", 2nd ed. Imprint New York, McGraw Hill , 2000
- [29] "LAN cable", http://www.zytrax.com/tech/layer_1/cables/tech_lan.htm
- [30] "Pin out", http://stason.org/TULARC/pc/pc_pinout.html
- [31] "Color code Standards", http://www.bluemax.net/techtips/networking/Wiring_Tips/Wiring100TX/colorcodestandards.htm
- [32] "Crossover Cable", http://www.makeitsimple.com/how-to/dyi_crossover.htm
- [33] "RJ45", <http://www.alatec.com/info/rj45.html>
- [34] "RJ45", <http://www.nullmodem.com/RJ-45.htm>

- [35] Justin Davies, Roger Whittaker, and William von Hagen, "SUSE Linux 9 Bible", Imprint Indianapolis, IN, Wiley , 2005.
- [36] John Bass, "Quagga router sets an acceptable pace", Network World
- [37] "Routing metrics",
http://www.cisco.com/univercd/cc/td/doc/cisintwk/ito_doc/routing.htm

APPENDICES

APPENDICES		Page
Appendix A	The daemons in Quagga and its configuration for the system	
Appendix A(i)	ZEBRA	55-58
Appendix A(ii)	RIPd	59-63
Appendix A(iii)	RIPngd	64-67
Appendix A(iv)	OSPFd	68-71
Appendix A(v)	OSPF6d	72-75
Appendix A(vi)	BGPd	76-79
Appendix B	The Final Year Project GANNT Chart	80

I. Zebra.conf

```
!  
hostname zebra                **Set hostname of the router.  
  
password quagga              **Set password for vty interface.  
  
enable password quagga      **Set enable password.  
  
log file /var/log/quagga/quagga.log **log into specified file.  
  
log stdout                   **enable logging output to stdout.  
  
log syslog                   **enable logging output to syslog.  
  
log record-priority          **to include the severity in all messages  
logged to a file, to stdout, or to a  
terminal monitor.  
  
service advanced-vty        **enable advanced mode VTY.  
  
service terminal-length 0    **set system wide line configuration. This  
command will applies to all VTY interfaces.  
  
!  
interface eth0               **set name for the interface.  
  
bandwidth 100                **set bandwidth value of the interface in  
kilobits/sec, for calculating OSPF cost,  
does not affect the actual device  
configuration.  
  
link-detect                  **enable the link-detect.  
  
ip address 192.168.0.10/32   **set the ip address for the  
interface.  
  
multicast                    **enable multicast flag for the  
interface.  
  
ipv6 nd suppress-ra  
!  
interface eth1  
bandwidth 100  
link-detect  
ip address 10.0.0.2/32  
multicast  
ipv6 nd suppress-ra  
!  
interface lo  
link-detect  
multicast  
!  
interface sit0  
ipv6 nd suppress-ra  
!  
ip route 10.0.0.0/8 10.0.0.2 **multiple nexthop static route.  
ip route 10.0.0.0/8 ppp0  
ip route 10.0.0.0/8 Null0
```

```

ip route 192.168.0.0/32 192.168.0.10
ip route 192.168.0.0/32 eth0
!
ip forwarding
ipv6 forwarding
!
line vty

access-class access-list
!
end

```

```

localhost:~ # rczebra start
Starting routing daemon (Zebra)
localhost:~ # telnet localhost 2601
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.

```

done

```

Hello, this is Quagga (version 0.98.5).
Copyright 1996-2005 Kunihiro Ishiguro, et al.

```

User Access Verification

```

Password:
zebra> enable
Password:

```

```

zebra# show ip route
Codes: K - kernel route, C - connected, S - static, R - RIP, O - OSPF,
       I - ISIS, B - BGP, > - selected route, * - FIB route

```

```

S>* 10.0.0.0/8 [1/0] via 10.0.0.2 inactive, bh
   *                is directly connected, ppp0 inactive, bh
   *                is directly connected, Null0, bh
K * 127.0.0.0/8 is directly connected, lo
C>* 127.0.0.0/8 is directly connected, lo
K>* 169.254.0.0/16 is directly connected, eth0
S> 192.168.0.0/32 [1/0] via 192.168.0.10 inactive
   *                is directly connected, eth0

```

```

zebra# show ipv6 route
Codes: K - kernel route, C - connected, S - static, R - RIPng, O - OSPFv3,
       I - ISIS, B - BGP, * - FIB route.

```

```

C>* ::1/128 is directly connected, lo

```

```

localhost:~ # ps -ef
UID      PID  PPID  C  STIME TTY          TIME CMD
root         1    0  0 13:09 ?           00:00:01 init [5]
root         2    1  0 13:09 ?           00:00:00 [ksoftirqd/0]
root         3    1  0 13:09 ?           00:00:00 [events/0]
root         4    1  0 13:09 ?           00:00:00 [khelper]
root         5    1  0 13:09 ?           00:00:00 [kthread]
root         7    5  0 13:09 ?           00:00:00 [kblockd/0]
root         8    5  0 13:09 ?           00:00:00 [kacpid]

```

```

root      121      5  0 13:09 ?          00:00:00 [pdflush]
root      122      5  0 13:09 ?          00:00:00 [pdflush]
root      124      5  0 13:09 ?          00:00:00 [aio/0]
root      123      1  0 13:09 ?          00:00:00 [kswapd0]
root      330      5  0 13:09 ?          00:00:00 [cqueue/0]
root      331      5  0 13:09 ?          00:00:00 [kseriod]
root      369      5  0 13:09 ?          00:00:00 [kpsmoused]
root      780      5  0 13:09 ?          00:00:00 [reiserfs/0]
root      844      1  0 13:09 ?          00:00:00 /sbin/udev --daemon
root     1302      5  0 13:09 ?          00:00:00 [kgameportd]
root     1360      5  0 13:09 ?          00:00:00 [khubd]
root     1359      1  0 13:09 ?          00:00:00 [shpchpd_event]
100      2112      1  0 13:09 ?          00:00:01 /usr/bin/dbus-daemon --system
root     2119      1  0 13:09 ?          00:00:00 /sbin/syslog-ng
root     2122      1  0 13:09 ?          00:00:00 /sbin/klogd -c 1 -x -x
root     2131      1  0 13:09 ?          00:00:00 /sbin/acpid
root     2150      1  0 13:09 ?          00:00:00 /sbin/resmgrd
root     2281      1  0 13:09 ?          00:00:02 /usr/sbin/hald --daemon=yes --
retain-privileges
root     2605  2281  0 13:09 ?          00:00:00 hald-addon-acpi
root     2830  2281  0 13:09 ?          00:00:00 hald-addon-storage
root     2833      1  0 13:09 ?          00:00:00 /sbin/auditd -n
root     2836      5  0 13:09 ?          00:00:00 [kauditd]
nobody   2863      1  0 13:09 ?          00:00:00 /sbin/portmap
root     2981      1  0 13:09 ?          00:00:01 zmd /usr/lib/zmd/zmd.exe
root     3078      1  0 13:09 ?          00:00:00 /opt/gnome/sbin/gdm
named    3088      1  0 13:09 ?          00:00:00 /usr/sbin/named -t
/var/lib/named -u named
root     3101      1  0 13:09 ?          00:00:00 /usr/sbin/nscd
root     3117      1  0 13:09 ?          00:00:00 startpar -f -- xdm
root     3196      1  0 13:09 ?          00:00:00 /usr/sbin/powersaved -d -f
/var/run/acpid.socket -v 3
root     3197      1  0 13:09 ?          00:00:00 /usr/sbin/sshd -o
PidFile=/var/run/sshd.init.pid
daemon   3202      1  0 13:09 ?          00:00:00 /usr/sbin/slpd
lp       3221      1  0 13:09 ?          00:00:00 /usr/sbin/cupsd
root     3243  3078  0 13:09 ?          00:00:00 /opt/gnome/sbin/gdm
root     3246  3243  1 13:09 tty7          00:00:33 /usr/X11R6/bin/X :0 -audit 0 -br
-auth /var/lib/gdm/:0.Xauth -nolisten tcp vt7
root     3279      1  0 13:09 ?          00:00:00 /usr/lib/postfix/master
postfix  3291  3279  0 13:09 ?          00:00:00 pickup -l -t fifo -u
postfix  3292  3279  0 13:09 ?          00:00:00 qmgr -l -t fifo -u
root     3310      1  0 13:09 ?          00:00:00 /usr/sbin/cron
root     3316      1  0 13:09 tty1          00:00:00 /sbin/mingetty --noclear tty1
root     3317      1  0 13:09 tty2          00:00:00 /sbin/mingetty tty2
root     3318      1  0 13:09 tty3          00:00:00 /sbin/mingetty tty3
root     3319      1  0 13:09 tty4          00:00:00 /sbin/mingetty tty4
root     3320      1  0 13:09 tty5          00:00:00 /sbin/mingetty tty5
root     3321      1  0 13:09 tty6          00:00:00 /sbin/mingetty tty6
root     3418  3243  0 13:10 ?          00:00:00 /opt/gnome/bin/gnome-session
root     3460      1  0 13:10 ?          00:00:00 /usr/bin/gpg-agent --sh --daemon
root     3464      1  0 13:10 ?          00:00:00 dbus-daemon --fork --print-pid 8
--print-address 6 --session
root     3465      1  0 13:10 ?          00:00:00 /usr/bin/dbus-launch --sh-syntax
--exit-with-session /usr/X11R6/bin/gnome
root     3469      1  0 13:10 ?          00:00:00 /opt/gnome/lib/GConf/2/gconfd-2
4

```

```

root      3474      1  0 13:10 ?          00:00:00 /opt/gnome/bin/gnome-keyring-
daemon
root      3476      1  0 13:10 ?          00:00:00 /opt/gnome/lib/bonobo/bonobo-
activation-server --ac-activate --ior-output-fd=17
root      3492      1  0 13:10 ?          00:00:00 /opt/gnome/lib/control-center-
2.0/gnome-settings-daemon --oaf-activate-iid=OAFIID:GNOME_Settingroot      3497
1  0 13:10 ?          00:00:00 /usr/bin/esd -terminate -nobeeps -as 2 -spawnfd 18
root      3504      1  0 13:10 ?          00:00:02 metacity --sm-save-file
1176113069-3488-1089425315.ms
root      3506      1  0 13:10 ?          00:00:21 nautilus --sm-config-prefix
/nautilus-10nNtp/ --sm-client-id 110a00000200011748917920000003519root
3508      1  0 13:10 ?          00:00:02 gnome-panel --sm-config-prefix /gnome-
panel-7Y1KGU/ --sm-client-id 110a000002000117489179200000root      3519      1  0
13:10 ?          00:00:00 /opt/gnome/sbin/gnome-vfs-daemon --oaf-activate-
iid=OAFIID:GNOME_VFS_Daemon_Factory --oaf-ior-froot      3523      1  0 13:10 ?
00:00:00 zen-updater --desktop /usr/lib/zen-updater/ZenUpdater.exe
root      3534      1  0 13:10 ?          00:00:02 /opt/gnome/lib/gnome-main-
menu/main-menu --oaf-activate-iid=OAFIID:GNOME_MainMenu_Factory --oafroot
3536      1  0 13:10 ?          00:00:00 /opt/gnome/bin/application-browser -h
root      3538      1  0 13:10 ?          00:00:00 nm-applet
root      3542      1  0 13:10 ?          00:00:00 gnome-volume-manager --sm-
disable
root      3543      1  0 13:10 ?          00:00:00 gnome-power-manager --sm-disable
root      3554      1  0 13:10 ?          00:00:00 gnome-terminal
root      3555      3554  0 13:10 ?          00:00:00 gnome-pty-helper
root      3556      3554  0 13:10 pts/0      00:00:00 bash
root      3574      1  0 13:10 ?          00:00:00 gnome-screensaver
-----
quagga   3589      1  0 13:10 ?          00:00:00 /usr/sbin/zebra -d
root      3592      1  0 13:11 ?          00:00:17 gnome-nettool
root      3700      1  0 13:12 ?          00:00:00 /opt/gnome/lib/nautilus/mapping-
daemon
root      3706      1  0 13:14 ?          00:00:06 gedit
root      3833      5  0 13:45 ?          00:00:00 [scsi_ah_1]
root      3834      5  0 13:45 ?          00:00:00 [usb-storage]
root      3884      2281  0 13:46 ?          00:00:00 hald-addon-storage
root      3886      2281  0 13:46 ?          00:00:00 hald-addon-storage
root      3923      3556  0 13:46 pts/0      00:00:00 ps -ef
localhost:~ #

```


II. RIPd.conf

```
!  
hostname ripd  
password quagga  
enable password quagga  
log stdout  
log syslog  
log record-priority  
!  
debug rip events  
debug rip packet  
debug rip zebra  
!  
key chain test  
key 1  
key-string test  
!  
interface eth0  
ip rip send version 1 2          **version 1 2 is specified;packets will be  
                                both broadcast and multicast.  
  
ip rip receive version 1 2      **selects which versions of RIP packets will  
                                be accepted on this interface.  
  
ip rip authentication mode md5 auth-length old-ripd  
ip rip authentication key-chain test          **for RIP authentication  
!  
interface eth1  
ip rip send version 1 2  
ip rip receive version 1 2  
ip rip authentication mode md5 auth-length old-ripd  
ip rip authentication key-chain test  
!  
router rip          **this command is necessary to enable RIP,  
                   must be enabled first before carrying out  
                   any of the RIP commands.  
  
version 2  
default-information originate  
redistribute kernel metric 2 route-map 1  
                                **redistributes routing information from  
                                kernel route entries into RIP tables.  
  
redistribute connected metric 2 route-map 1  
                                **routes into the RIP tables.  
  
redistribute static metric 2 route-map 1  
                                **redistributes routing information from  
                                static route entries into RIP tables  
  
redistribute ospf metric 2 route-map 1  
                                **redistributes routing information from  
                                ospf route entries into RIP tables  
  
redistribute bgp metric 2 route-map 1  
                                **redistributes routing information from bgp  
                                route entries into RIP tables
```

```

network 10.0.0.0/32          **set the RIP enable by network.
network 192.168.0.0/32
network eth0
network eth1                **set a RIP enabled interface by ifname.
                             Both Tx and Rx of RIP packets will be enable
                             on the port specified in the network ifname
                             command.

neighbor 10.0.0.0
neighbor 192.168.0.0        **specify the RIP neighbor.
neighbor 127.0.0.0
passive-interface eth0|default **sets the specified interface to passive
                             mode. (Passive mode: Rx packets are
                             processed as normal and ripd does not send
                             either multicast or unicast RIP packets
                             except to RIP neighbors). The default is to
                             be passive on all interfaces.

passive-interface eth1|default
distance 120                **default RIP distance is 120
!
access-list private permit 10.0.0.0/32
access-list private permit 192.168.0.0/32
access-list private deny any
!
route-map 1 permit 1
  match interface 1
  set ip next-hop 10.0.0.0
  call 1
  on-match goto 2
! line vty
!
end

```

```

localhost:~ # rcripd start
Starting rip daemon (Zebra)2007/04/16 20:42:51 debugging: RIP: Redistribute new
prefix 0.0.0.0/0 on the interface eth0
2007/04/16 20:42:51 debugging: RIP: interface eth0: passive = 0
2007/04/16 20:42:51 debugging: RIP: interface eth1: passive = 0
2007/04/16 20:42:51 debugging: RIP: interface eth0: passive = 0
2007/04/16 20:42:51 debugging: RIP: interface eth1: passive = 0

```

done

```

localhost:~ # telnet localhost 2602
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.

Hello, this is Quagga (version 0.98.5).
Copyright 1996-2005 Kunihiro Ishiguro, et al.

```

User Access Verification

```

Password:
ripd> enable
Password:

```

```

ripd# show ip rip
Codes: R - RIP, C - connected, S - Static, O - OSPF, B - BGP
Sub-codes:
      (n) - normal, (s) - static, (d) - default, (r) - redistribute,
      (i) - interface

```

	Network	Next Hop	Metric	From	Tag	Time
R(d)	0.0.0.0/0	0.0.0.0	1	self	0	
S(r)	10.0.0.0/8	10.0.0.2	1	self	0	
C(i)	10.0.0.0/24	0.0.0.0	1	self	0	
C(i)	10.0.0.2/32	0.0.0.0	1	self	0	
K(r)	169.254.0.0/16	0.0.0.0	1	self	0	
C(i)	192.168.0.0/24	0.0.0.0	1	self	0	
S(r)	192.168.0.0/32	0.0.0.0	1	self	0	
C(i)	192.168.0.10/32	0.0.0.0	1	self	0	

```

localhost:~ # ps -ef
UID      PID  PPID  C  STIME TTY          TIME CMD
root         1    0  0  13:09 ?           00:00:01 init [5]
root         2    1  0  13:09 ?           00:00:00 [ksoftirqd/0]
root         3    1  0  13:09 ?           00:00:00 [events/0]
root         4    1  0  13:09 ?           00:00:00 [khelper]
root         5    1  0  13:09 ?           00:00:00 [kthread]
root         7    5  0  13:09 ?           00:00:00 [kblockd/0]
root         8    5  0  13:09 ?           00:00:00 [kacpid]
root        121   5  0  13:09 ?           00:00:00 [pdflush]
root        122   5  0  13:09 ?           00:00:00 [pdflush]
root        124   5  0  13:09 ?           00:00:00 [aio/0]
root        123   1  0  13:09 ?           00:00:00 [kswapd0]
root        330   5  0  13:09 ?           00:00:00 [cqueue/0]
root        331   5  0  13:09 ?           00:00:00 [kseriod]
root        369   5  0  13:09 ?           00:00:00 [kpsmoused]
root        780   5  0  13:09 ?           00:00:00 [reiserfs/0]
root        844   1  0  13:09 ?           00:00:00 /sbin/udevd --daemon
root       1302   5  0  13:09 ?           00:00:00 [kgameportd]
root       1360   5  0  13:09 ?           00:00:00 [khubd]
root       1359   1  0  13:09 ?           00:00:00 [shpchpd_event]
100       2112   1  0  13:09 ?           00:00:01 /usr/bin/dbus-daemon --system
root       2119   1  0  13:09 ?           00:00:00 /sbin/syslog-ng
root       2122   1  0  13:09 ?           00:00:00 /sbin/klogd -c 1 -x -x
root       2131   1  0  13:09 ?           00:00:00 /sbin/acpid
root       2150   1  0  13:09 ?           00:00:00 /sbin/resmgrd
root       2281   1  0  13:09 ?           00:00:02 /usr/sbin/hald --daemon=yes --
retain-privileges
root       2605  2281  0  13:09 ?           00:00:00 hald-addon-acpi
root       2830  2281  0  13:09 ?           00:00:00 hald-addon-storage
root       2833   1  0  13:09 ?           00:00:00 /sbin/auditd -n
root       2836   5  0  13:09 ?           00:00:00 [kauditd]
nobody    2863   1  0  13:09 ?           00:00:00 /sbin/portmap
root       2981   1  0  13:09 ?           00:00:01 zmd /usr/lib/zmd/zmd.exe
root       3078   1  0  13:09 ?           00:00:00 /opt/gnome/sbin/gdm
named     3088   1  0  13:09 ?           00:00:00 /usr/sbin/named -t
/var/lib/named -u named
root      3101   1  0  13:09 ?           00:00:00 /usr/sbin/nscd
root      3117   1  0  13:09 ?           00:00:00 startpar -f -- xdm

```

```

root      3196      1  0 13:09 ?          00:00:00 /usr/sbin/powersaved -d -f
/var/run/acpid.socket -v 3
root      3197      1  0 13:09 ?          00:00:00 /usr/sbin/sshd -o
PidFile=/var/run/sshd.init.pid
daemon    3202      1  0 13:09 ?          00:00:00 /usr/sbin/slpd
lp        3221      1  0 13:09 ?          00:00:00 /usr/sbin/cupsd
root      3243     3078  0 13:09 ?          00:00:00 /opt/gnome/sbin/gdm
root      3246     3243  1 13:09 tty7        00:00:57 /usr/X11R6/bin/X :0 -audit 0 -br
-auth /var/lib/gdm/:0.Xauth -nolisten tcp vt7
root      3279      1  0 13:09 ?          00:00:00 /usr/lib/postfix/master
postfix   3291     3279  0 13:09 ?          00:00:00 pickup -l -t fifo -u
postfix   3292     3279  0 13:09 ?          00:00:00 qmgr -l -t fifo -u
root      3310      1  0 13:09 ?          00:00:00 /usr/sbin/cron
root      3316      1  0 13:09 tty1        00:00:00 /sbin/mingetty --noclear tty1
root      3317      1  0 13:09 tty2        00:00:00 /sbin/mingetty tty2
root      3318      1  0 13:09 tty3        00:00:00 /sbin/mingetty tty3
root      3319      1  0 13:09 tty4        00:00:00 /sbin/mingetty tty4
root      3320      1  0 13:09 tty5        00:00:00 /sbin/mingetty tty5
root      3321      1  0 13:09 tty6        00:00:00 /sbin/mingetty tty6
root      3418     3243  0 13:10 ?          00:00:00 /opt/gnome/bin/gnome-session
root      3460      1  0 13:10 ?          00:00:00 /usr/bin/gpg-agent --sh --daemon
root      3464      1  0 13:10 ?          00:00:00 dbus-daemon --fork --print-pid 8
--print-address 6 --session
root      3465      1  0 13:10 ?          00:00:00 /usr/bin/dbus-launch --sh-syntax
--exit-with-session /usr/X11R6/bin/gnome
root      3469      1  0 13:10 ?          00:00:00 /opt/gnome/lib/GConf/2/gconfd-2
4
root      3474      1  0 13:10 ?          00:00:00 /opt/gnome/bin/gnome-keyring-
daemon
root      3476      1  0 13:10 ?          00:00:00 /opt/gnome/lib/bonobo/bonobo-
activation-server --ac-activate --ior-output-fd=17
root      3492      1  0 13:10 ?          00:00:01 /opt/gnome/lib/control-center-
2.0/gnome-settings-daemon --oaf-activate-iid=OAFIID:GNOME_Settingroot      3497
1  0 13:10 ?          00:00:00 /usr/bin/esd -terminate -nobeeps -as 2 -spawnfd 18
root      3504      1  0 13:10 ?          00:00:03 metacity --sm-save-file
1176113069-3488-1089425315.ms
root      3506      1  0 13:10 ?          00:00:21 nautilus --sm-config-prefix
/nautilus-10nNtp/ --sm-client-id 110a000002000117489179200000035190root
3508      1  0 13:10 ?          00:00:04 gnome-panel --sm-config-prefix /gnome-
panel-7Y1KGU/ --sm-client-id 110a000002000117489179200000root      3519      1  0
13:10 ?          00:00:00 /opt/gnome/sbin/gnome-vfs-daemon --oaf-activate-
iid=OAFIID:GNOME_VFS_Daemon_Factory --oaf-ior-froot      3523      1  0 13:10 ?
00:00:00 zen-updater --desktop /usr/lib/zen-updater/ZenUpdater.exe
root      3534      1  0 13:10 ?          00:00:03 /opt/gnome/lib/gnome-main-
menu/main-menu --oaf-activate-iid=OAFIID:GNOME_MainMenu_Factory --oafroot
3536      1  0 13:10 ?          00:00:00 /opt/gnome/bin/application-browser -h
root      3538      1  0 13:10 ?          00:00:00 nm-applet
root      3542      1  0 13:10 ?          00:00:00 gnome-volume-manager --sm-
disable
root      3543      1  0 13:10 ?          00:00:00 gnome-power-manager --sm-disable
root      3554      1  0 13:10 ?          00:00:06 gnome-terminal
root      3555     3554  0 13:10 ?          00:00:00 gnome-pty-helper
root      3556     3554  0 13:10 pts/0        00:00:00 bash
root      3574      1  0 13:10 ?          00:00:00 gnome-screensaver
root      3592      1  0 13:11 ?          00:00:22 gnome-nettool
root      3700      1  0 13:12 ?          00:00:00 /opt/gnome/lib/nautilus/mapping-
daemon

```

```
root      3706      1  0 13:14 ?      00:00:12 gedit
root      3833      5  0 13:45 ?      00:00:00 [scsi_ah_1]
root      3834      5  0 13:45 ?      00:00:00 [usb-storage]
root      3884     2281  0 13:46 ?      00:00:00 hald-addon-storage
root      3886     2281  0 13:46 ?      00:00:00 hald-addon-storage
quagga    3996      1  0 14:01 ?      00:00:00 /usr/sbin/ripd -d
root      4007     3556  0 14:04 pts/0    00:00:00 ps -ef
localhost:~ #
```

III. RIPngd.conf

```
!  
hostname ripngd  
password quagga  
enable password quagga  
!  
debug ripng events  
debug ripng packet  
debug ripng zebra  
!  
router ripng                                **enable RIPng  
  default-information originate             **set RIPng enable interface by  
network network                             **set RIPng enable interface by ifname  
network  
  network eth0                               **set RIPng enable interface by ifname  
  network eth1  
  passive-interface eth0  
  passive-interface eth1  
  distribute-list access_list in eth0  
  distribute-list access_list in eth1  
  distribute-list local-only out sit1      **ripngd filtering commands  
!  
ip prefix-list 1 seq 5 permit any  
! ipv6 access-list 1 permit any  
!  
line vty  
!  
end
```

```
localhost:~ # rcripngd start  
Starting ripng daemon (Zebra) done  
localhost:~ # telnet localhost 2603  
Trying 127.0.0.1...  
Connected to localhost.  
Escape character is '^]'.  
  
Hello, this is Quagga (version 0.98.5).  
Copyright 1996-2005 Kunihiro Ishiguro, et al.
```

User Access Verification

```
Password:  
ripngd> enable  
Password:  
ripngd# show ipv6 ripng  
Codes: R - RIPng, C - connected, S - Static, O - OSPF, B - BGP  
Sub-codes:  
  (n) - normal, (s) - static, (d) - default, (r) - redistribute,  
  (i) - interface, (a/S) - aggregated/Suppressed  
  
Network      Next Hop      Via      Metric Tag Time  
R(d) ::/0    ::           self      1      0
```

```

ripngd# show ipv6 ripng status
Routing Protocol is "RIPng"
  Sending updates every 30 seconds with +/-50%, next due in 2 seconds
  Timeout after 180 seconds, garbage collect after 120 seconds
  Outgoing update filter list for all interface is not set
    sit1 filtered by local-only
  Incoming update filter list for all interface is not set
    eth0 filtered by access_list
    eth1 filtered by access_list
  Default redistribution metric is 1
  Redistributing:
  Default version control: send version 1, receive version 1
  Interface          Send  Recv
Routing for Networks:
  network
  eth0
  eth1
Routing Information Sources:
  Gateway            BadPackets BadRoutes  Distance Last Update

```

```

localhost:~ # ps -ef
UID      PID  PPID  C  STIME TTY          TIME CMD
root         1    0  0  13:09 ?           00:00:01 init [5]
root         2    1  0  13:09 ?           00:00:00 [ksoftirqd/0]
root         3    1  0  13:09 ?           00:00:00 [events/0]
root         4    1  0  13:09 ?           00:00:00 [khelper]
root         5    1  0  13:09 ?           00:00:00 [kthread]
root         7    5  0  13:09 ?           00:00:00 [kblockd/0]
root         8    5  0  13:09 ?           00:00:00 [kacpid]
root        121    5  0  13:09 ?           00:00:00 [pdflush]
root        122    5  0  13:09 ?           00:00:00 [pdflush]
root        124    5  0  13:09 ?           00:00:00 [aio/0]
root        123    1  0  13:09 ?           00:00:00 [kswapd0]
root        330    5  0  13:09 ?           00:00:00 [cqueue/0]
root        331    5  0  13:09 ?           00:00:00 [kseriod]
root        369    5  0  13:09 ?           00:00:00 [kpsmoused]
root        780    5  0  13:09 ?           00:00:00 [reiserfs/0]
root        844    1  0  13:09 ?           00:00:00 /sbin/udevd --daemon
root       1302    5  0  13:09 ?           00:00:00 [kgameportd]
root       1360    5  0  13:09 ?           00:00:00 [khubd]
root       1359    1  0  13:09 ?           00:00:00 [shpchpd_event]
100       2112    1  0  13:09 ?           00:00:03 /usr/bin/dbus-daemon --system
root       2119    1  0  13:09 ?           00:00:00 /sbin/syslog-ng
root       2122    1  0  13:09 ?           00:00:00 /sbin/klogd -c 1 -x -x
root       2131    1  0  13:09 ?           00:00:00 /sbin/acpid
root       2150    1  0  13:09 ?           00:00:00 /sbin/resmgrd
root       2281    1  0  13:09 ?           00:00:03 /usr/sbin/hald --daemon=yes --
retain-privileges
root       2605  2281  0  13:09 ?           00:00:00 hald-addon-acpi
root       2830  2281  0  13:09 ?           00:00:00 hald-addon-storage
root       2833    1  0  13:09 ?           00:00:00 /sbin/auditd -n
root       2836    5  0  13:09 ?           00:00:00 [kauditd]
nobody    2863    1  0  13:09 ?           00:00:00 /sbin/portmap
root      3078    1  0  13:09 ?           00:00:00 /opt/gnome/sbin/gdm
named     3088    1  0  13:09 ?           00:00:00 /usr/sbin/named -t
/var/lib/named -u named

```

```

root      3101      1  0 13:09 ?           00:00:00 /usr/sbin/nscd
root      3117      1  0 13:09 ?           00:00:00 startpar -f -- xdm
root      3196      1  0 13:09 ?           00:00:00 /usr/sbin/powersaved -d -f
/var/run/acpid.socket -v 3
root      3197      1  0 13:09 ?           00:00:00 /usr/sbin/sshd -o
PidFile=/var/run/sshd.init.pid
daemon    3202      1  0 13:09 ?           00:00:00 /usr/sbin/slpd
lp        3221      1  0 13:09 ?           00:00:00 /usr/sbin/cupsd
root      3243     3078  0 13:09 ?           00:00:00 /opt/gnome/sbin/gdm
root      3246     3243  1 13:09 tty7         00:01:31 /usr/X11R6/bin/X :0 -audit 0 -br
-auth /var/lib/gdm/:0.Xauth -nolisten tcp vt7
root      3279      1  0 13:09 ?           00:00:00 /usr/lib/postfix/master
postfix   3291     3279  0 13:09 ?           00:00:00 pickup -l -t fifo -u
postfix   3292     3279  0 13:09 ?           00:00:00 qmgr -l -t fifo -u
root      3310      1  0 13:09 ?           00:00:00 /usr/sbin/cron
root      3316      1  0 13:09 tty1         00:00:00 /sbin/mingetty --noclear tty1
root      3317      1  0 13:09 tty2         00:00:00 /sbin/mingetty tty2
root      3318      1  0 13:09 tty3         00:00:00 /sbin/mingetty tty3
root      3319      1  0 13:09 tty4         00:00:00 /sbin/mingetty tty4
root      3320      1  0 13:09 tty5         00:00:00 /sbin/mingetty tty5
root      3321      1  0 13:09 tty6         00:00:00 /sbin/mingetty tty6
root      3418     3243  0 13:10 ?           00:00:00 /opt/gnome/bin/gnome-session
root      3460      1  0 13:10 ?           00:00:00 /usr/bin/gpg-agent --sh --daemon
root      3464      1  0 13:10 ?           00:00:00 dbus-daemon --fork --print-pid 8
--print-address 6 --session
root      3465      1  0 13:10 ?           00:00:00 /usr/bin/dbus-launch --sh-syntax
--exit-with-session /usr/X11R6/bin/gnome
root      3469      1  0 13:10 ?           00:00:00 /opt/gnome/lib/GConf/2/gconfd-2
4
root      3474      1  0 13:10 ?           00:00:00 /opt/gnome/bin/gnome-keyring-
daemon
root      3476      1  0 13:10 ?           00:00:00 /opt/gnome/lib/bonobo/bonobo-
activation-server --ac-activate --ior-output-fd=17
root      3492      1  0 13:10 ?           00:00:01 /opt/gnome/lib/control-center-
2.0/gnome-settings-daemon --oaf-activate-iid=OAFIID:GNOME_Settingroot      3497
1  0 13:10 ?           00:00:00 /usr/bin/esd -terminate -nobeeps -as 2 -spawnfd 18
root      3504      1  0 13:10 ?           00:00:05 metacity --sm-save-file
1176113069-3488-1089425315.ms
root      3506      1  0 13:10 ?           00:00:24 nautilus --sm-config-prefix
/nautilus-10nNtp/ --sm-client-id 110a00000200011748917920000003519root
3508      1  0 13:10 ?           00:00:05 gnome-panel --sm-config-prefix /gnome-
panel-7Y1KGU/ --sm-client-id 110a000002000117489179200000root      3519      1  0
13:10 ?           00:00:00 /opt/gnome/sbin/gnome-vfs-daemon --oaf-activate-
iid=OAFIID:GNOME_VFS_Daemon_Factory --oaf-ior-froot      3523      1  0 13:10 ?
00:00:01 zen-updater --desktop /usr/lib/zen-updater/ZenUpdater.exe
root      3534      1  0 13:10 ?           00:00:04 /opt/gnome/lib/gnome-main-
menu/main-menu --oaf-activate-iid=OAFIID:GNOME_MainMenu_Factory --oafroot
3536      1  0 13:10 ?           00:00:00 /opt/gnome/bin/application-browser -h
root      3538      1  0 13:10 ?           00:00:00 nm-applet
root      3542      1  0 13:10 ?           00:00:00 gnome-volume-manager --sm-
disable
root      3543      1  0 13:10 ?           00:00:00 gnome-power-manager --sm-disable
root      3554      1  0 13:10 ?           00:00:10 gnome-terminal
root      3555     3554  0 13:10 ?           00:00:00 gnome-pty-helper
root      3556     3554  0 13:10 pts/0         00:00:00 bash
root      3574      1  0 13:10 ?           00:00:00 gnome-screensaver
root      3592      1  0 13:11 ?           00:00:35 gnome-nettool

```


root	3700	1	0	13:12	?	00:00:00	/opt/gnome/lib/nautilus/mapping-
daemon							
root	3706	1	0	13:14	?	00:00:17	gedit
root	3833	5	0	13:45	?	00:00:00	[scsi_ah_1]
root	3834	5	0	13:45	?	00:00:00	[usb-storage]
root	3884	2281	0	13:46	?	00:00:00	hald-addon-storage
root	3886	2281	0	13:46	?	00:00:00	hald-addon-storage
root	2981	1	0	13:09	?	00:00:01	zmd /usr/lib/zmd/zmd.exe --sleep
82199							
quagga	4168	1	0	14:37	?	00:00:00	/usr/sbin/ripngd -d
root	4170	3556	0	14:38	pts/0	00:00:00	ps -ef

IV. OSPFd.conf

```
!
hostname ospfd
password quagga
enable password quagga
service advanced-vty
!
debug ospf lsa
debug ospf zebra
debug ospf event
debug ospf packet all
!
!
interface eth0
 ip ospf authentication
!
interface eth1
 ip ospf authentication
!
interface lo
!
interface sit0
!
router ospf                                **enable the OSPF process.
ospf abr-type cisco                        **the default ABR (Area Border Router) type
is Cisco.
 redistribute connected                    **redistributes routes to ospf
 passive-interface eth0
 passive-interface eth1
 network 10.0.0.0/32 area 0.0.0.0
 network 192.168.0.0/32 area 0.0.0.1
 area 0.0.0.0 authentication message-digest
 area 0.0.0.0 range 10.0.0.0/32
 area 0.0.0.1 authentication message-digest
 area 0.0.0.1 range 192.168.0.0/32

default-information originate              **Originate an AS-External LSA describing a
                                           default route into all external-routing
                                           capable areas, of the specified metric and
                                           metric type.

!
access-list 1 permit any
!
ip prefix-list 1 seq 5 permit any
!
ipv6 access-list 1 permit any
!
ipv6 prefix-list 1 seq 5 permit any
!
route-map 1 permit 64
 match interface eth1
 call 1
 on-match goto 65
!
smux peer 1
line vty
! end
```

```
localhost:~ # rcospfd start
Starting ospf daemon (Zebra)
localhost:~ # telnet localhost 2604
```

done

```
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.

```

```
Hello, this is Quagga (version 0.98.5).
Copyright 1996-2005 Kunihiro Ishiguro, et al.
```

User Access Verification

Password:

```
ospfd> enable
```

Password:

```
ospfd# show ip ospf
```

```
OSPF Routing Process, Router ID: 10.0.0.2
Supports only single TOS (TOS0) routes
This implementation conforms to RFC2328
RFC1583Compatibility flag is disabled
SPF schedule delay 1 secs, Hold time between two SPF's 1 secs
Refresh timer 10 secs
This router is an ASBR (injecting external routing information)
Number of external LSA 0. Checksum Sum 0x00000000
Number of areas attached to this router: 2
```

Area ID: 0.0.0.0 (Backbone)

```
Number of interfaces in this area: Total: 0, Active: 0
Number of fully adjacent neighbors in this area: 0
Area has message digest authentication
SPF algorithm executed 1 times
Number of LSA 1
Number of router LSA 1. Checksum Sum 0x000088c0
Number of network LSA 0. Checksum Sum 0x00000000
Number of summary LSA 0. Checksum Sum 0x00000000
Number of ASBR summary LSA 0. Checksum Sum 0x00000000
Number of NSSA LSA 0. Checksum Sum 0x00000000
```

Area ID: 0.0.0.1

```
Shortcutting mode: Default, S-bit consensus: ok
Number of interfaces in this area: Total: 0, Active: 0
Number of fully adjacent neighbors in this area: 0
Area has message digest authentication
Number of full virtual adjacencies going through this area: 0
SPF algorithm executed 1 times
Number of LSA 1
Number of router LSA 1. Checksum Sum 0x000088c0
Number of network LSA 0. Checksum Sum 0x00000000
Number of summary LSA 0. Checksum Sum 0x00000000
Number of ASBR summary LSA 0. Checksum Sum 0x00000000
Number of NSSA LSA 0. Checksum Sum 0x00000000
```

```
ospfd# show ip ospf database
```

```
OSPF Router with ID (10.0.0.2)
Router Link States (Area 0.0.0.0)
```

Link ID	ADV Router	Age	Seq#	CkSum	Link count
10.0.0.2	10.0.0.2	80	0x80000001	0x88c0	0

Router Link States (Area 0.0.0.1)

Link ID	ADV Router	Age	Seq#	CkSum	Link count
10.0.0.2	10.0.0.2	80	0x80000001	0x88c0	0

localhost:~ # ps -ef

UID	PID	PPID	C	STIME	TTY	TIME	CMD
root	1	0	0	13:09	?	00:00:01	init [5]
root	2	1	0	13:09	?	00:00:00	[ksoftirqd/0]
root	3	1	0	13:09	?	00:00:00	[events/0]
root	4	1	0	13:09	?	00:00:00	[khelper]
root	5	1	0	13:09	?	00:00:00	[kthread]
root	7	5	0	13:09	?	00:00:00	[kblockd/0]
root	8	5	0	13:09	?	00:00:00	[kacpid]
root	121	5	0	13:09	?	00:00:00	[pdflush]
root	122	5	0	13:09	?	00:00:00	[pdflush]
root	124	5	0	13:09	?	00:00:00	[aio/0]
root	123	1	0	13:09	?	00:00:00	[kswapd0]
root	330	5	0	13:09	?	00:00:00	[cqueue/0]
root	331	5	0	13:09	?	00:00:00	[kseriod]
root	369	5	0	13:09	?	00:00:00	[kpsmoused]
root	780	5	0	13:09	?	00:00:00	[reiserfs/0]
root	844	1	0	13:09	?	00:00:00	/sbin/udev --daemon
root	1302	5	0	13:09	?	00:00:00	[kgameportd]
root	1360	5	0	13:09	?	00:00:00	[khubd]
root	1359	1	0	13:09	?	00:00:00	[shpchpd_event]
100	2112	1	0	13:09	?	00:00:05	/usr/bin/dbus-daemon --system
root	2119	1	0	13:09	?	00:00:00	/sbin/syslog-ng
root	2122	1	0	13:09	?	00:00:00	/sbin/klogd -c 1 -x -x
root	2131	1	0	13:09	?	00:00:00	/sbin/acpid
root	2150	1	0	13:09	?	00:00:00	/sbin/resmgrd
root	2281	1	0	13:09	?	00:00:05	/usr/sbin/hald --daemon=yes --retain-privileges
root	2605	2281	0	13:09	?	00:00:00	hald-addon-acpi
root	2830	2281	0	13:09	?	00:00:00	hald-addon-storage
root	2833	1	0	13:09	?	00:00:00	/sbin/auditd -n
root	2836	5	0	13:09	?	00:00:00	[kauditd]
nobody	2863	1	0	13:09	?	00:00:00	/sbin/portmap
root	3078	1	0	13:09	?	00:00:00	/opt/gnome/sbin/gdm
named	3088	1	0	13:09	?	00:00:00	/usr/sbin/named -t /var/lib/named -u named
root	3101	1	0	13:09	?	00:00:00	/usr/sbin/nscd
root	3117	1	0	13:09	?	00:00:00	startpar -f -- xdm
root	3196	1	0	13:09	?	00:00:00	/usr/sbin/powersaved -d -f /var/run/acpid.socket -v 3
root	3197	1	0	13:09	?	00:00:00	/usr/sbin/sshd -o PidFile=/var/run/sshd.init.pid
daemon	3202	1	0	13:09	?	00:00:00	/usr/sbin/slpd
lp	3221	1	0	13:09	?	00:00:00	/usr/sbin/cupsd
root	3243	3078	0	13:09	?	00:00:00	/opt/gnome/sbin/gdm
root	3246	3243	2	13:09	tty7	00:02:44	/usr/X11R6/bin/X :0 -audit 0 -br -auth /var/lib/gdm/:0.Xauth -nolisten tcp vt7
root	3279	1	0	13:09	?	00:00:00	/usr/lib/postfix/master

```

postfix 3292 3279 0 13:09 ? 00:00:00 qmgr -l -t fifo -u
root 3310 1 0 13:09 ? 00:00:00 /usr/sbin/cron
root 3316 1 0 13:09 tty1 00:00:00 /sbin/mingetty --noclear tty1
root 3317 1 0 13:09 tty2 00:00:00 /sbin/mingetty tty2
root 3318 1 0 13:09 tty3 00:00:00 /sbin/mingetty tty3
root 3319 1 0 13:09 tty4 00:00:00 /sbin/mingetty tty4
root 3320 1 0 13:09 tty5 00:00:00 /sbin/mingetty tty5
root 3321 1 0 13:09 tty6 00:00:00 /sbin/mingetty tty6
root 3418 3243 0 13:10 ? 00:00:00 /opt/gnome/bin/gnome-session
root 3460 1 0 13:10 ? 00:00:00 /usr/bin/gpg-agent --sh --daemon
root 3464 1 0 13:10 ? 00:00:00 dbus-daemon --fork --print-pid 8
--print-address 6 --session
root 3465 1 0 13:10 ? 00:00:00 /usr/bin/dbus-launch --sh-syntax
--exit-with-session /usr/X11R6/bin/gnome
root 3469 1 0 13:10 ? 00:00:01 /opt/gnome/lib/GConf/2/gconfd-2
4
root 3474 1 0 13:10 ? 00:00:00 /opt/gnome/bin/gnome-keyring-
daemon
root 3476 1 0 13:10 ? 00:00:00 /opt/gnome/lib/bonobo/bonobo-
activation-server --ac-activate --ior-output-fd=17
root 3492 1 0 13:10 ? 00:00:02 /opt/gnome/lib/control-center-
2.0/gnome-settings-daemon --oaf-activate-iid=OAFIID:GNOME_Settingroot 3497
1 0 13:10 ? 00:00:00 /usr/bin/esd -terminate-nobeeps -as 2 -spawnfd 18
root 3504 1 0 13:10 ? 00:00:07 metacity --sm-save-file
1176113069-3488-1089425315.ms
root 3506 1 0 13:10 ? 00:00:25 nautilus --sm-config-prefix
/nautilus-10nNtp/ --sm-client-id 110a000002000117489179200000035190root
3508 1 0 13:10 ? 00:00:09 gnome-panel --sm-config-prefix /gnome-
panel-7Y1KGU/ --sm-client-id 110a000002000117489179200000root 3519 1 0
13:10 ? 00:00:00 /opt/gnome/sbin/gnome-vfs-daemon --oaf-activate-
iid=OAFIID:GNOME_VFS_Daemon_Factory --oaf-ior-froot 3523 1 0 13:10 ?
00:00:01 zen-updater --desktop /usr/lib/zen-updater/ZenUpdater.exe
root 3534 1 0 13:10 ? 00:00:05 /opt/gnome/lib/gnome-main-
menu/main-menu --oaf-activate-iid=OAFIID:GNOME_MainMenu_Factory --oafroot
3536 1 0 13:10 ? 00:00:01 /opt/gnome/bin/application-browser -h
root 3538 1 0 13:10 ? 00:00:00 nm-applet
root 3542 1 0 13:10 ? 00:00:00 gnome-volume-manager --sm-
disable
root 3543 1 0 13:10 ? 00:00:00 gnome-power-manager --sm-disable
root 3554 1 0 13:10 ? 00:00:24 gnome-terminal
root 3555 3554 0 13:10 ? 00:00:00 gnome-pty-helper
root 3556 3554 0 13:10 pts/0 00:00:00 bash
root 3574 1 0 13:10 ? 00:00:01 gnome-screensaver
root 3592 1 0 13:11 ? 00:00:55 gnome-nettool
root 3700 1 0 13:12 ? 00:00:00 /opt/gnome/lib/nautilus/mapping-
daemon
root 3706 1 0 13:14 ? 00:00:30 gedit
root 3833 5 0 13:45 ? 00:00:00 [scsi_ah_1]
root 3834 5 0 13:45 ? 00:00:00 [usb-storage]
root 3884 2281 0 13:46 ? 00:00:00 hald-addon-storage
root 3886 2281 0 13:46 ? 00:00:00 hald-addon-storage
root 2981 1 0 13:09 ? 00:00:01 zmd /usr/lib/zmd/zmd.exe --sleep
82199
postfix 4206 3279 0 14:48 ? 00:00:00 pickup -l -t fifo -u
quagga 4326 1 0 15:17 ? 00:00:00 /usr/sbin/ospfd -d
root 4328 3556 0 15:18 pts/0 00:00:00 ps -ef

```

VI. OSPF6d.conf

```
!  
hostname ospf6d  
password quagga  
enable password quagga  
!  
debug ospf6 lsa unknown  
!  
interface eth0  
  ipv6 ospf6 cost 1                **sets interface's output cost,  
  default=1  
  ipv6 ospf6 hello-interval 40    **sets interface's Hello Interval,  
  default=40  
  ipv6 ospf6 dead-interval 40     **sets interface's Router Dead  
  Interval, default=40  
  
  ipv6 ospf6 retransmit-interval 5 **sets interface's Rxmt Interval,  
  default=5  
  ipv6 ospf6 priority 1          **sets interface's Router Priority,  
  default=1  
  ipv6 ospf6 transmit-delay 1    **sets interface's Inf-Trans-Delay,  
  default=1  
  ipv6 ospf6 instance-id 0  
  ipv6 ospf6 passive  
!  
interface eth1  
  ipv6 ospf6 cost 1  
  ipv6 ospf6 hello-interval 10  
  ipv6 ospf6 dead-interval 40  
  ipv6 ospf6 retransmit-interval 5  
  ipv6 ospf6 priority 1  
  ipv6 ospf6 transmit-delay 1  
  ipv6 ospf6 instance-id 0  
  ipv6 ospf6 passive  
!  
router ospf6  
  router-id 10.0.0.0  
  redistribute connected  
  redistribute static  
  redistribute ripng  
  redistribute bgp  
  area 0.0.0.0 range 2001:770:105:2::/64  
  interface eth0 area 0.0.0.0  
  interface eth1 area 127.0.0.1  
!  
line vty  
!  
end
```

```
localhost:~ # rcospf6d start
Starting ospf daemon (Zebra)
localhost:~ # telnet localhost 2606
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.

```

done

```
Hello, this is Quagga (version 0.98.5).
Copyright 1996-2005 Kunihiro Ishiguro, et al.

```

User Access Verification

```
Password:
ospf6d> enable
Password:
ospf6d# show ipv6 ospf6
  OSPFv3 Routing Process (0) with Router-ID 10.0.0.0
  Running 00:00:52
  Number of AS scoped LSAs is 0
  Number of areas in this router is 2
  Area 0.0.0.0
    Number of Area scoped LSAs is 0
    Interface attached to this area: eth0
  Area 127.0.0.1
    Number of Area scoped LSAs is 0
    Interface attached to this area: eth1
ospf6d# show zebra
Zebra Infomation
  enable: 1 fail: 0
  redistribute default: 7
  redistribute: Connect Static RIPng OSPF6 BGP

```

```
localhost:~ # ps -ef
```

UID	PID	PPID	C	STIME	TTY	TIME	CMD
root	1	0	0	13:09	?	00:00:01	init [5]
root	2	1	0	13:09	?	00:00:00	[ksoftirqd/0]
root	3	1	0	13:09	?	00:00:00	[events/0]
root	4	1	0	13:09	?	00:00:00	[khelper]
root	5	1	0	13:09	?	00:00:00	[kthread]
root	7	5	0	13:09	?	00:00:00	[kblockd/0]
root	8	5	0	13:09	?	00:00:00	[kacpid]
root	121	5	0	13:09	?	00:00:00	[pdflush]
root	122	5	0	13:09	?	00:00:00	[pdflush]
root	124	5	0	13:09	?	00:00:00	[aio/0]
root	123	1	0	13:09	?	00:00:00	[kswapd0]
root	330	5	0	13:09	?	00:00:00	[cqueue/0]
root	331	5	0	13:09	?	00:00:00	[kseriod]
root	369	5	0	13:09	?	00:00:00	[kpsmoused]
root	780	5	0	13:09	?	00:00:00	[reiserfs/0]
root	844	1	0	13:09	?	00:00:00	/sbin/udevd --daemon
root	1302	5	0	13:09	?	00:00:00	[kgameportd]
root	1360	5	0	13:09	?	00:00:00	[khubd]
root	1359	1	0	13:09	?	00:00:00	[shpchpd_event]
100	2112	1	0	13:09	?	00:00:06	/usr/bin/dbus-daemon --system

```

root      2119      1  0 13:09 ?          00:00:00 /sbin/syslog-ng
root      2122      1  0 13:09 ?          00:00:00 /sbin/klogd -c 1 -x -x
root      2131      1  0 13:09 ?          00:00:00 /sbin/acpid
root      2150      1  0 13:09 ?          00:00:00 /sbin/resmgrd
root      2281      1  0 13:09 ?          00:00:05 /usr/sbin/hald --daemon=yes --
retain-privileges
root      2605     2281  0 13:09 ?          00:00:00 hald-addon-acpi
root      2830     2281  0 13:09 ?          00:00:00 hald-addon-storage
root      2833      1  0 13:09 ?          00:00:00 /sbin/auditd -n
root      2836      5  0 13:09 ?          00:00:00 [kauditd]
nobody    2863      1  0 13:09 ?          00:00:00 /sbin/portmap
root      3078      1  0 13:09 ?          00:00:00 /opt/gnome/sbin/gdm
named     3088      1  0 13:09 ?          00:00:00 /usr/sbin/named -t
/var/lib/named -u named
root      3101      1  0 13:09 ?          00:00:00 /usr/sbin/nscd
root      3117      1  0 13:09 ?          00:00:00 startpar -f -- xdm
root      3196      1  0 13:09 ?          00:00:00 /usr/sbin/powersaved -d -f
/var/run/acpid.socket -v 3
root      3197      1  0 13:09 ?          00:00:00 /usr/sbin/sshd -o
PidFile=/var/run/sshd.init.pid
daemon   3202      1  0 13:09 ?          00:00:00 /usr/sbin/slpd
lp        3221      1  0 13:09 ?          00:00:00 /usr/sbin/cupsd
root     3243     3078  0 13:09 ?          00:00:00 /opt/gnome/sbin/gdm
root     3246     3243  2 13:09 tty7        00:03:15 /usr/X11R6/bin/X :0 -audit 0 -br
-auth /var/lib/gdm/:0.Xauth -nolisten tcp vt7
root     3279      1  0 13:09 ?          00:00:00 /usr/lib/postfix/master
postfix  3292     3279  0 13:09 ?          00:00:00 qmgr -l -t fifo -u
root     3310      1  0 13:09 ?          00:00:00 /usr/sbin/cron
root     3316      1  0 13:09 tty1        00:00:00 /sbin/mingetty --noclear tty1
root     3317      1  0 13:09 tty2        00:00:00 /sbin/mingetty tty2
root     3318      1  0 13:09 tty3        00:00:00 /sbin/mingetty tty3
root     3319      1  0 13:09 tty4        00:00:00 /sbin/mingetty tty4
root     3320      1  0 13:09 tty5        00:00:00 /sbin/mingetty tty5
root     3321      1  0 13:09 tty6        00:00:00 /sbin/mingetty tty6
root     3418     3243  0 13:10 ?          00:00:00 /opt/gnome/bin/gnome-session
root     3460      1  0 13:10 ?          00:00:00 /usr/bin/gpg-agent --sh --daemon
root     3464      1  0 13:10 ?          00:00:00 dbus-daemon --fork --print-pid 8
--print-address 6 --session
root     3465      1  0 13:10 ?          00:00:00 /usr/bin/dbus-launch --sh-syntax
--exit-with-session /usr/X11R6/bin/gnome
root     3469      1  0 13:10 ?          00:00:01 /opt/gnome/lib/GConf/2/gconfd-2
4
root     3474      1  0 13:10 ?          00:00:00 /opt/gnome/bin/gnome-keyring-
daemon
root     3476      1  0 13:10 ?          00:00:00 /opt/gnome/lib/bonobo/bonobo-
activation-server --ac-activate --ior-output-fd=17
root     3492      1  0 13:10 ?          00:00:02 /opt/gnome/lib/control-center-
2.0/gnome-settings-daemon --oaf-activate-iid=OAFIID:GNOME_Settingroot      3497
1  0 13:10 ?          00:00:00 /usr/bin/esd -terminate -nobeeps -as 2 -spawnfd 18
root     3504      1  0 13:10 ?          00:00:09 metacity --sm-save-file
1176113069-3488-1089425315.ms
root     3506      1  0 13:10 ?          00:00:27 nautilus --sm-config-prefix
/nautilus-10nNtp/ --sm-client-id 110a000002000117489179200000035190root
3508      1  0 13:10 ?          00:00:11 gnome-panel --sm-config-prefix /gnome-
panel-7Y1KGU/ --sm-client-id 110a000002000117489179200000root      3519      1  0
13:10 ?          00:00:00 /opt/gnome/sbin/gnome-vfs-daemon --oaf-activate-

```



```

iid=OAFIID:GNOME_VFS_Daemon_Factory --oaf-ior-froot      3523      1  0 13:10 ?
00:00:01 zen-updater --desktop /usr/lib/zen-updater/ZenUpdater.exe
root      3534      1  0 13:10 ?      00:00:06 /opt/gnome/lib/gnome-main-
menu/main-menu --oaf-activate-iid=OAFIID:GNOME_MainMenu_Factory --oafroot
3536      1  0 13:10 ?      00:00:01 /opt/gnome/bin/application-browser -h
root      3538      1  0 13:10 ?      00:00:00 nm-applet
root      3542      1  0 13:10 ?      00:00:00 gnome-volume-manager --sm-
disable
root      3543      1  0 13:10 ?      00:00:00 gnome-power-manager --sm-disable
root      3554      1  0 13:10 ?      00:00:31 gnome-terminal
root      3555  3554  0 13:10 ?      00:00:00 gnome-pty-helper
root      3556  3554  0 13:10 pts/0    00:00:00 bash
root      3574      1  0 13:10 ?      00:00:01 gnome-screensaver
root      3592      1  0 13:11 ?      00:01:05 gnome-nettool
root      3700      1  0 13:12 ?      00:00:00 /opt/gnome/lib/nautilus/mapping-
daemon
root      3706      1  0 13:14 ?      00:00:39 gedit
root      3833      5  0 13:45 ?      00:00:00 [scsi_ah_1]
root      3834      5  0 13:45 ?      00:00:00 [usb-storage]
root      3884  2281  0 13:46 ?      00:00:00 hald-addon-storage
root      3886  2281  0 13:46 ?      00:00:00 hald-addon-storage
root      2981      1  0 13:09 ?      00:00:01 zmd /usr/lib/zmd/zmd.exe --sleep
82199
postfix   4206  3279  0 14:48 ?      00:00:00 pickup -l -t fifo -u
quagga    4396      1  0 15:36 ?      00:00:00 /usr/sbin/ospf6d -d
root      4407  3556  0 15:36 pts/0    00:00:00 ps -ef

```

VII. BGPd.conf

```
!  
hostname bgpd  
password quagga  
enable password quagga  
service advanced-vty  
!  
bgp multiple-instance  
bgp config-type cisco  
!  
router bgp 7675                                **enable a BGP protocol with the specified  
                                                asn. After this statement, we can put any  
                                                BGP commands.  
  
no synchronization  
bgp router-id 10.0.0.0  
bgp always-compare-med  
redistribute kernel  
redistribute connected  
redistribute static  
redistribute rip                               **redistribute RIP route to BGP process  
redistribute ospf                             **redistribute OSPF route to BGP process  
neighbor 10.0.0.0 remote-as 100  
neighbor 10.0.0.0 route-map RMAP in  
no auto-summary  
!  
address-family ipv6  
redistribute kernel                           **redistribute kernel route to BGP process  
  
redistribute connected                       **redistribute connected route to BGP  
process  
  
redistribute static                         **redistribute static route to BGP process  
  
redistribute ripng                          **redistribute RIPng route to BGP process  
  
redistribute ospf6                          **redistribute ospf6 route to BGP process  
  
exit-address-family  
!  
ip prefix-list PLIST seq 5 permit 10.0.0.0/8  
!  
ip community-list 1 permit 0:80 0:90  
ip community-list 70 permit 7675:70  
ip community-list 70 deny  
ip community-list 80 permit 7675:80  
ip community-list 80 deny  
ip community-list 90 permit 7675:90  
ip community-list 90 deny  
  
ip community-list standard CLIST permit 7675:100  
**this command defines a new standard community list.  
ip community-list expanded EXPAND permit line  
**this command defines a new expanded community list.  
ip community-list standard FILTER deny 1:1  
ip community-list standard FILTER permit  
!
```

```
route-map RMAP permit 10
  match community 70
  match ip address prefix-list PLIST
  set local-preference 70
  set community 7675:80
!
route-map RMAP permit 20
  match community 80
  set local-preference 80
!
route-map RMAP permit 30
  match community 90
  set local-preference 90
!
smux peer 1
line vty
!
end
```

```
localhost:~ # rcbgpd start
Starting bgp daemon (Zebra)
localhost:~ # telnet localhost 2605
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.

```

done

```
Hello, this is Quagga (version 0.98.5).
Copyright 1996-2005 Kunihiro Ishiguro, et al.
```

User Access Verification

```
Password:
bgpd> enable
Password:
bgpd#
bgpd# show ip community-list
Community standard list 1
  permit 0:80 0:90
Community standard list 70
  permit 7675:70
  deny
Community standard list 80
  permit 7675:80
  deny
Community standard list 90
  permit 7675:90
  deny
Named Community standard list CLIST
  permit 7675:100
Named Community expanded list EXPAND
  permit line
Named Community standard list FILTER
  deny 1:1
  permit
```

```

localhost:~ # ps -ef
UID      PID  PPID  C  STIME TTY          TIME CMD
root      1    0    0 13:09 ?          00:00:01 init [5]
root      2    1    0 13:09 ?          00:00:00 [ksoftirqd/0]
root      3    1    0 13:09 ?          00:00:00 [events/0]
root      4    1    0 13:09 ?          00:00:00 [khelper]
root      5    1    0 13:09 ?          00:00:00 [kthread]
root      7    5    0 13:09 ?          00:00:00 [kblockd/0]
root      8    5    0 13:09 ?          00:00:00 [kacpid]
root     121  5    0 13:09 ?          00:00:00 [pdflush]
root     122  5    0 13:09 ?          00:00:00 [pdflush]
root     124  5    0 13:09 ?          00:00:00 [aio/0]
root     123  1    0 13:09 ?          00:00:00 [kswapd0]
root     330  5    0 13:09 ?          00:00:00 [cqueue/0]
root     331  5    0 13:09 ?          00:00:00 [kseriod]
root     369  5    0 13:09 ?          00:00:00 [kpsmoused]
root     780  5    0 13:09 ?          00:00:00 [reiserfs/0]
root     844  1    0 13:09 ?          00:00:00 /sbin/udevd --daemon
root    1302  5    0 13:09 ?          00:00:00 [kgameportd]
root    1360  5    0 13:09 ?          00:00:00 [khubd]
root    1359  1    0 13:09 ?          00:00:00 [shpchpd_event]
100     2112  1    0 13:09 ?          00:00:04 /usr/bin/dbus-daemon --system
root    2119  1    0 13:09 ?          00:00:00 /sbin/syslog-ng
root    2122  1    0 13:09 ?          00:00:00 /sbin/klogd -c 1 -x -x
root    2131  1    0 13:09 ?          00:00:00 /sbin/acpid
root    2150  1    0 13:09 ?          00:00:00 /sbin/resmgrd
root    2281  1    0 13:09 ?          00:00:04 /usr/sbin/hald --daemon=yes --
retain-privileges
root    2605 2281  0 13:09 ?          00:00:00 hald-addon-acpi
root    2830 2281  0 13:09 ?          00:00:00 hald-addon-storage
root    2833  1    0 13:09 ?          00:00:00 /sbin/auditd -n
root    2836  5    0 13:09 ?          00:00:00 [kauditd]
nobody   2863  1    0 13:09 ?          00:00:00 /sbin/portmap
root    3078  1    0 13:09 ?          00:00:00 /opt/gnome/sbin/gdm
named    3088  1    0 13:09 ?          00:00:00 /usr/sbin/named -t
/var/lib/named -u named
root    3101  1    0 13:09 ?          00:00:00 /usr/sbin/nscd
root    3117  1    0 13:09 ?          00:00:00 startpar -f -- xdm
root    3196  1    0 13:09 ?          00:00:00 /usr/sbin/powersaved -d -f
/var/run/acpid.socket -v 3
root    3197  1    0 13:09 ?          00:00:00 /usr/sbin/sshd -o
PidFile=/var/run/sshd.init.pid
daemon   3202  1    0 13:09 ?          00:00:00 /usr/sbin/slpd
lp       3221  1    0 13:09 ?          00:00:00 /usr/sbin/cupsd
root    3243 3078  0 13:09 ?          00:00:00 /opt/gnome/sbin/gdm
root    3246 3243  1 13:09 tty7       00:01:57 /usr/X11R6/bin/X :0 -audit 0 -br
-auth /var/lib/gdm/:0.Xauth -nolisten tcp vt7
root    3279  1    0 13:09 ?          00:00:00 /usr/lib/postfix/master
postfix  3292 3279  0 13:09 ?          00:00:00 qmgr -l -t fifo -u
root    3310  1    0 13:09 ?          00:00:00 /usr/sbin/cron
root    3316  1    0 13:09 tty1       00:00:00 /sbin/mingetty --noclear tty1
root    3317  1    0 13:09 tty2       00:00:00 /sbin/mingetty tty2
root    3318  1    0 13:09 tty3       00:00:00 /sbin/mingetty tty3
root    3319  1    0 13:09 tty4       00:00:00 /sbin/mingetty tty4
root    3320  1    0 13:09 tty5       00:00:00 /sbin/mingetty tty5
root    3321  1    0 13:09 tty6       00:00:00 /sbin/mingetty tty6
root    3418 3243  0 13:10 ?          00:00:00 /opt/gnome/bin/gnome-session

```

```

root      3460      1  0 13:10 ?          00:00:00 /usr/bin/gpg-agent --sh --daemon
root      3464      1  0 13:10 ?          00:00:00 dbus-daemon --fork --print-pid 8
--print-address 6 --session
root      3465      1  0 13:10 ?          00:00:00 /usr/bin/dbus-launch --sh-syntax
--exit-with-session /usr/X11R6/bin/gnome
root      3469      1  0 13:10 ?          00:00:01 /opt/gnome/lib/GConf/2/gconfd-2
4
root      3474      1  0 13:10 ?          00:00:00 /opt/gnome/bin/gnome-keyring-
daemon
root      3476      1  0 13:10 ?          00:00:00 /opt/gnome/lib/bonobo/bonobo-
activation-server --ac-activate --ior-output-fd=17
root      3492      1  0 13:10 ?          00:00:01 /opt/gnome/lib/control-center-
2.0/gnome-settings-daemon --oaf-activate-iid=OAFIID:GNOME_Settingroot      3497
1  0 13:10 ?          00:00:00 /usr/bin/esd -terminate -nobeeps -as 2 -spawnfd 18
root      3504      1  0 13:10 ?          00:00:06 metacity --sm-save-file
1176113069-3488-1089425315.ms
root      3506      1  0 13:10 ?          00:00:25 nautilus --sm-config-prefix
/nautilus-10nNtp/ --sm-client-id 110a00000200011748917920000003519root
3508      1  0 13:10 ?          00:00:06 gnome-panel --sm-config-prefix /gnome-
panel-7Y1KGU/ --sm-client-id 110a000002000117489179200000root      3519      1  0
13:10 ?          00:00:00 /opt/gnome/sbin/gnome-vfs-daemon --oaf-activate-
iid=OAFIID:GNOME_VFS_Daemon_Factory --oaf-ior-froot      3523      1  0 13:10 ?
00:00:01 zen-updater --desktop /usr/lib/zen-updater/ZenUpdater.exe
root      3534      1  0 13:10 ?          00:00:04 /opt/gnome/lib/gnome-main-
menu/main-menu --oaf-activate-iid=OAFIID:GNOME_MainMenu_Factory --oafroot
3536      1  0 13:10 ?          00:00:00 /opt/gnome/bin/application-browser -h
root      3538      1  0 13:10 ?          00:00:00 nm-applet
root      3542      1  0 13:10 ?          00:00:00 gnome-volume-manager --sm-
disable
root      3543      1  0 13:10 ?          00:00:00 gnome-power-manager --sm-disable
root      3554      1  0 13:10 ?          00:00:13 gnome-terminal
root      3555      3554  0 13:10 ?          00:00:00 gnome-pty-helper
root      3556      3554  0 13:10 pts/0      00:00:00 bash
root      3574      1  0 13:10 ?          00:00:00 gnome-screensaver
root      3592      1  0 13:11 ?          00:00:44 gnome-nettool
root      3700      1  0 13:12 ?          00:00:00 /opt/gnome/lib/nautilus/mapping-
daemon
root      3706      1  0 13:14 ?          00:00:22 gedit
root      3833      5  0 13:45 ?          00:00:00 [scsi_ah_1]
root      3834      5  0 13:45 ?          00:00:00 [usb-storage]
root      3884      2281  0 13:46 ?          00:00:00 hald-addon-storage
root      3886      2281  0 13:46 ?          00:00:00 hald-addon-storage
root      2981      1  0 13:09 ?          00:00:01 zmd /usr/lib/zmd/zmd.exe --sleep
82199
postfix   4206      3279  0 14:48 ?          00:00:00 pickup -l -t fifo -u
quagga    4226      1  0 14:53 pts/0      00:00:00 /usr/sbin/bgpd
root      4237      3556  0 14:54 pts/0      00:00:00 ps -ef

```

Activities	Semester 1 (2006)																				
	July				August					September					October				November		
	I	II	III	IV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Project Title Submission				■																	
Work Plan Approval					■	■															
Proposal Report						■	■	■													
Discussion with Supervisor						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Searching For Information					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Gathering and Arranging Information					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Analysis									■	■	■	■	■	■	■	■	■	■	■	■	■
Final Draft Report																					
Viva																					
Submitting Report & Log Book																					

Activities	Semester 2 (2007)																				
	December					January				February				March			April				
	19	20	21	22	23	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Title Submission																					
Work Plan Approval																					
Proposal Report																					
Discussion with Supervisor	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Searching For Information	■	■	■	■	■																
Gathering and Arranging Information						■	■	■	■	■	■	■	■	■							
Analysis	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					
Final Draft Report																	■	■	■	■	
Viva																				■	■
Submitting Report & Log Book																				■	■

THE FINAL YEAR PROJECT GANNT CHART