

- *sh ip bgp neigh 172.24.64.5*
shortcut for *show ip bgp neighbors*
show details for peering with 172.24.64.5
- *sh ip bgp 149.244.5.3*
shurtcut for *show ip bgp*
show bgp route details for destination 149.244.5.3
- *sh ip bgp regexp _3320_*
list all bgp paths with as 3320 in it
for more informations on as path prefixes: info
quagga

Registry

- *ssh registry@1.2.3.4*
Connection to postgresql server
you will be welcomed to a postgresql shell
the correct ip address and username will be announced during the workshop
- *SELECT * FROM whois(23);*
query as number 23 from the whois database
- *SELECT * FROM whois('192.168.23.5/32');*
query ip address 192.168.23.5 from the whois database

Useful Utilities

- *ping 192.168.23.1*
pings 192.168.23.21
a ping command can also be found in the vtysh shell
- *traceroute 192.168.23.1*
traeroute to 192.168.23.1
a traceroute command can also be found in the vtysh shell
- *mtr 192.168.23.1*
a nicer to use traceroute/ping program
- *ipcalc ipcalculator netmask whatmask*
helps with partitioning your subnets
- *netstat*
diagnoses your network stack

- *tcpdump*
dump packets travelling to the network
- *arpwatch*
helps tracking arp addresses on your network
- *nmap*
scans the network
a ping scan is also available (-sP)
- *tcptraceroute 192.168.23.1 22*
traceroute with tcp packets with a specific tcp port
- *lft*
“layer-4 traceroute tool”
- *nstat*
prints various kernel statistics
best used with watch -n1
- *lnstat*
prints out various kernel statistics
- *arp-scan*
scan on mac level
- *arping*
ping on mac level
- *scapy*
powerful ip packet manipulation tool

Kernel Tweaks

- *net.ipv4.conf.all.arp_announce*
only advertise arp address sitting on the subnet where the ip packet leaves
- *net.ipv4.conf.all.arp_ignore*
switches between lose-end mode and hard-end mode
- *net.ipv4.conf.all.arp_filter*
useful for multiple subnets on one interface
you also have to control source routing!
- *net.ipv4.neigh.default.base_reachable_time*
controls the arp address lifetime in the cache
- *net.ipv4.conf.all.rp_filter*
enables/disables reverse path filter
- *modprobe pktgen; ls /proc/net/pktgen/*
in kernel packet generator

Routing Workshop

hannes

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Ethernet

- *ip ll*
shortcut for *ip link list*
list all available interfaces on the system
- *ethtool eth0*
discover link and various settings of the network card
- *ethtool -s eth0 duplex half speed 10 autoneg off*
set various ethernet parameters
- *ip n l*
shortcut for *ip neighbor list*
list arp table

VLans

- *vconfig add eth0 23*
add a vlan with vlan id 23 to interface eth0
the new interface will be called eth0.23
- *vconfig rem eth0.23*
remove interface and vlan eth0.23
- *cat /proc/net/vlan/config*
check various vlan related settings
- *cat /proc/net/vlan/eth0.15*
check per vlan statistics and settings

Basic Linux Interface Manipulation

- *ip a l dev eth0*
shortcut for *ip address list*

list ip addresses configured at eth0

- *ip a a 10.0.0.2/32 dev lo*
shortcut for *ip address add*
add 10.0.0.2 as loopback address to interface lo
- *ip a d 10.0.0.2/32 dev lo*
shortcut for *ip route delete*
delete the ip from the interface
- *ip a f dev eth0*
shortcut for *ip address flush*
flush all ip addresses from eth0
- *ip mo all*
shortcut for *ip monitor all*
display changes to interface configuration

Basic Linux Routing Commands

- *sysctl -w net.ipv4.ip_forward=1*
enable forwarding
- *ip r l*
shortcut for *ip route list*
display the kernel routing table
- *ip r g 23.23.23.23*
display the route for the specified target
shortcut for *ip route get*
- *ip r a 23.23.42.0/24 via 23.23.23.25*
shortcut for *ip route add*
add a route to 23.23.23.42.0/24 via 23.23.23.25
- *ip r d 23.23.42.0/24 via 23.23.23.25*
shortcut for *ip route delete*
delete a route
- *ip r a 23.23.23.99/32 dev eth0*
setup an interface route to 23.23.23.99 over eth0

Quagga Startup

- starting is up to your distribution:
/etc/init.d/quagga
/etc/init.d/ospfd
/etc/init.d/bgpd

- *VTYSH_PAGER=cat vtysh*
Connecting to the quagga control interface
- *conf t*
shortcut for *configure terminal*
brings the quagga shell into configure mode

Quagga General Configuration

- *service password-encryption*
enables password encryption
- *service advanced-vty*
enables advanced-vty mode
- *password foobar2342*
sets password foobar2342
used for connection remote to zebra
- *enable password foobar2342*
sets password for enabled mode
useful to let people look at the running state
but not let them into configure mode

Display general Quagga state

- *show ...*
from normal mode
- *do show ...*
from configure mode
- *sh ru*
shurtcut for *show running-config*
shows the running config
- *sh da*
shurtcut for *show daemons*
shows which daemons are running
or which services are enabled
- *sh in*
shurtcut for *show interface*
shows which interfaces quagga knows about
- *sh ip ro*
shurtcut for *show ip route*
shows quaggas internal routing table

OSPF

- *interface eth0*
ip ospf message-digest-key 1 md5 foobar2342
set per interface ospf authentication keys
- *router ospf*
start ospf routing process
- *area 0 authentication message-digest enable*
message-digest authentication in area 0
- *network 192.168.7.0/24 area 0*
set network 192.168.7.0/24 in area 0
- *passive-interface eth0.15*
don't speak eth0.15 on interface eth0.15
- *default-information originate always*
always advertise a default route
- *show ip ospf*
show ospf process status
- *show ip ospf neighbors*
show ospf neighbors
- *show ip ospf database*
show ospf process database
- *show ip ospf interface*
show ospf information regarding interfaces
- *show ip ospf route*
show ospf routing table

BGP

- *router bgp 1223*
start bgp routing process with local as 1223
- *network 10.192.168.0/24*
announce network 10.192.168.0/24 via bgp
- *neighbor 172.24.64.5 remote-as 64515*
peer with 172.24.64.5 with remote as 64515
if remote-as is same as local → iBGP
if remote-as different as local → eBGP
- *sh ip bgp sum*
shurtcut for *show ip bgp summary*
show peering summary