Ganeti + Networks = gnt-network

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Overview

1. **Why gnt-network?**
   - MAC + IP + link + mode = enough?
   - Challenges
   - gnt-network support

2. **snf-network + nfdhcpd**

3. **Hands on gnt-network**

MAC + IP + link + mode = enough?

NIC configuration

- DHCP: Subnet? IPv6?
- mode=bridged. `brctl addif` only? firewall?
- All NICs same MAC prefix. Why?

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Management

- Which VMs are on the same collision domain?
- A VM wants an IP. Which is available?
- One router broke down. Renumber VMs now! How?

- easy way to assign IPs to instances [1]

- provide a way to configure each NIC differently

- find a way to hide underlying infrastructure

- better networking overview

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[1]In multiple clusters if resources are shared allocation must be done externally

gnt-network: Who does what?

masterd ⇒ config.data integrity

- Abstract network infra ⇒ network + netparams @ nodegroup
- IP uniqueness inside networks ⇒ IP pool Management [a]
- encapsulate network info in NIC objects ⇒ RPC

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External scripts and hooks ⇒ ping vm1.ganeti.example.com

- use exported environment prvided by noded
- `brctl, iptables, ebtables, ip rule, etc.`
- update external dhcp/dns server entries
- let VM act unaware of the "situation" (dhclient, etc.)

gnt-network + external scripts

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snf-network: node level scripts and hooks

1. overrides Ganeti default scripts (kvm-ifup, vif-ganeti)
2. looks for specific tag types in NIC's network
3. applies corresponding rules
4. creates nfdhcpd binding files
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nfdhcpd: node level DHCP server based on NFQUEUE

1. listens on specific NFQUEUE
2. updates its leases db (inotify on specific dir for binding files)
3. mangles DHCP requests and replies based on its db
4. responds to RS and NS for IPv6 auto-configuration

gnt-network –help

Example (Create and connect a new network)

```
gnt-network add --network 192.168.1.0/24 \
               --gateway 192.168.1.1 \
               --tags nfdhcpd net1
gnt-network connect net1 bridged prv0
```

Example (Create an instance inside this network)

```
gnt-instance add --net 0:ip=pool,network=net1 ... inst1
gnt-instance info inst1
gnt-network info net1
```

Example (Use snf-network and nfdhcpd)

```
apt-get install snf-network nfdhcpd
iptables -t mangle -A PREROUTING -i prv+ \
         -p udp -m udp --dport 67 \
         -j NFQUEUE --queue-num 42
ip addr add 192.168.1.1/24 dev prv0
```

Example (Test connectivity)

```
gnt-instance reboot inst1
ping 192.168.1.2
```

References

📄 snf-network (0.14.0)

https://code.grnet.gr/git/snf-network
deb http://apt.dev.grnet.gr/ squeeze/.

📄 nfdhcpd (0.11.5-2)

https://code.grnet.gr/git/snf-nfdhcpd
deb http://apt.dev.grnet.gr/ squeeze/.

Thanks!