Managing your network with Netmagis

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FOSDEM 2012
What is Netmagis?

► Netmagis = NETwork MAnaGement Information System
► Open Source, BSD license
► Context: Osiris, a large campus network
  ■ 1500 network equipments, 400 subnets, 200 contacts
► Not Osiris-specific
  ■ A tool for any network, large or small
► Web application
► Manages the Network Information System
  ■ Central repository of all objects managed by the network operator
  ■ Processes
  ■ Consistency, exhaustivity, documentation, automation...
Some functions of Netmagis

► Managing hosts: names, IPv4 and IPv6 addresses
  → **Automatic** generation of DNS zones, DHCP configurations...

► Topology: VLAN, links between equipments
  → **Automatic** generation of network maps
  → Setting a VLAN
  → **Multi-vendor environment** (Cisco, HP, Juniper)

► Metrology: traffic graphs
  → **Automatic** generation (RRD database, SNMP polling)

► Mac: locate a host by its IP address
  → Find the MAC address and the interface/equipment

► **Delegate** all these functions to other people
## Add host or alias

### Add host

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>myhost01</td>
</tr>
<tr>
<td>IP address</td>
<td>2001:db8:1:1:1:1:1:1</td>
</tr>
<tr>
<td>MAC address</td>
<td>08:00:01:02:03:04</td>
</tr>
<tr>
<td>Host type</td>
<td>PC/Unix</td>
</tr>
<tr>
<td>Comment</td>
<td>Example host</td>
</tr>
<tr>
<td>Responsible (name)</td>
<td>John Doe</td>
</tr>
<tr>
<td>Responsible (mail)</td>
<td><a href="mailto:jdoe@mymaildomain.org">jdoe@mymaildomain.org</a></td>
</tr>
</tbody>
</table>

### Search for an IPv4 block

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPv4 network</td>
<td>172.16.1.0/24 2001:db8:1:1::/64 (Backbone)</td>
</tr>
<tr>
<td>Address count</td>
<td>1</td>
</tr>
</tbody>
</table>

### Add alias

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alias name</td>
<td>. netmagis.maquette</td>
</tr>
<tr>
<td>Host</td>
<td>. netmagis.maquette</td>
</tr>
</tbody>
</table>

Add
## IPv4 address map

List at 04/02/2012 11:36:25.

| address not allowed | available address | declared address | non-declared address within a DHCP range |

<table>
<thead>
<tr>
<th>172.16.1.0</th>
<th>172.16.1.16</th>
<th>172.16.1.32</th>
<th>172.16.1.48</th>
<th>172.16.1.64</th>
<th>172.16.1.80</th>
<th>172.16.1.96</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<td>16</td>
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<td>102</td>
</tr>
<tr>
<td>172.16.1.112</td>
<td>172.16.1.114</td>
<td>172.16.1.116</td>
<td>172.16.1.12</td>
<td>172.16.1.128</td>
<td>172.16.1.144</td>
<td>172.16.1.146</td>
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<tr>
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<td>243</td>
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<td>245</td>
<td>246</td>
</tr>
</tbody>
</table>

237 available addresses / 256 total [Detail]
Topology: L2
Topology: L3

Enter an equipment
Enter a VLAN
Enter an IP address 130.79.202.1
## Topology: network equipments

<table>
<thead>
<tr>
<th>Enter an equipment</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>cnetmaq</td>
<td></td>
</tr>
</tbody>
</table>

Enter a VLAN

Enter an IP address

---

Equipment cnetmaq cisco WS-C2960-24TT-L

- FastEthernet0/1 Ether
  - Vlan 2000 (management vlan) (native vlan)

- FastEthernet0/2 Ether
  - Vlan 2000 (management vlan) (native vlan)

- FastEthernet0/3 Ether
  - Vlan 1 (default) (native vlan)

- FastEthernet0/4 Ether
  - Vlan 1 (default) (native vlan)

- GigabitEthernet0/1
  - Trunk L1 to inetmaq ge-0/0/0
  - Vlan 2000 (management vlan)
Topology: interface modification

Edit interface FastEthernet0/4 on cnetmaq

- Description: PC of John Doe (room #123)
- VLAN: 2001 (visitors)
- Sensors: traffic_S123

You can also edit more than one interfaces simultaneously

- Works on Cisco, HP and Juniper equipments
- Can be delegated to other admins
Topology: traffic on an interface

Enter an equipment: cnetmaq
Enter a VLAN
Enter an IP address

Equipment cnetmaq cisco WS-C2960-24TT-L [Edit interfaces]

- FastEthernet0/1 Ether [Edit]
  Vlan 2000 (management vlan) (native vlan)

- FastEthernet0/2 Ether [Edit]
  Vlan 2000 (management vlan) (native vlan)

- FastEthernet0/3 Ether [Edit]
  Vlan 1 (default) (native vlan)

- FastEthernet0/4 Ether [Edit]
  Vlan 1 (default) (native vlan)

- GigabitEthernet0/0, trunk L1 to inetmaq ge-0/0/0
  Vlan 2000 (management vlan)
Topology: traffic on an interface

Traffic on interface GigabitEthernet0/1 of cnetmaq

Display data between [ ] at [ ] h and [ ] at [ ] h, Display

Traffic on interface GigabitEthernet0/1 of cnetmaq

- **maximum**
  - entrant: 90.90 Mb/s
  - sortant: 70.86 Mb/s

- **moyen**
  - entrant: 2.16 Mb/s
  - sortant: 4.28 Mb/s

- **actuel**
  - entrant: 0.04 Mb/s
  - sortant: 0.82 Mb/s
MAC: locate an IP address

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Adresse IP</th>
<th>Adresse MAC</th>
<th>Dernière occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Détails</td>
<td>130.79.6.1 (res-a.u-strasbg.fr.)</td>
<td>00:1c:c0:5a:d9:04</td>
<td>(date effacée)</td>
</tr>
<tr>
<td>Détails</td>
<td>130.79.6.1 (res-a.u-strasbg.fr.)</td>
<td>00:17:31:c1:c7:66</td>
<td>22/10/2010 18:01:08</td>
</tr>
</tbody>
</table>

1 associations IP-MAC trouvées pour 2001:660:4701::2001::1 :

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Adresse IP</th>
<th>Adresse MAC</th>
<th>Dernière occurrence</th>
</tr>
</thead>
</table>
Functional domains

- DHCP
- DNS
- Mail routing
- Central repository management
- Authentication and authorization
- Network and equipment management
- Host management
- MAC address management
- topology
- métrology

Network and equipment management
Configuration-driven automation

Network administrator

Topology server

Configuration modification

Download

Model of the network
A simple modification in the configuration of a network equipment:

add (link number, sensor number) in the interface description:

The modification is detected; it triggers a chain of actions:

→ Analysis of the configuration
→ Matching identical link numbers
→ Building of a (highly detailed) network model
→ Automatic generation of traffic sensors
→ SNMP polling and creation of an RRD database
Network model

SW1

L23

SW2

L9

SW3
Network model
Under the hood

- Languages: Tcl, C, Perl
- Database: PostgreSQL
- Web Server: any web server implementing CGI
- Topology: Rancid
- Metrology: RRDTool
- Installation
  - FreeBSD port, Debian package (v2.1)
- VCS: http://github.com/pdav/netmagis
- All contributions are welcome!
Conclusion

► Netmagis evolved over many years
► Maturity: used in production since 2002
► Packed with functions
  ■ Modules were developed following our operational needs
► Network management is complex
  ■ Manual handling → inconsistencies and malfunctions
  ■ Automation is mandatory
  ■ You need a tool
► Choose Netmagis! (and give us feedback!)

http://netmagis.org/