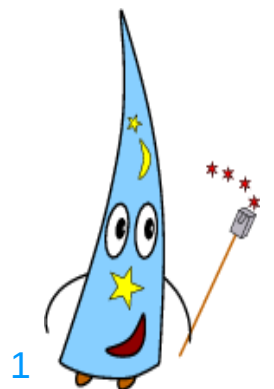


Managing your network with Netmagis

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Université de Strasbourg

FOSDEM 2012



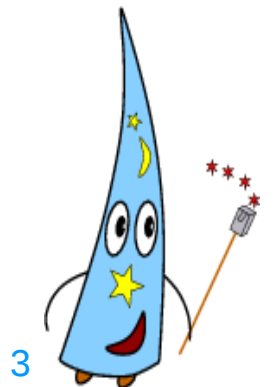
What is Netmagis?

- ▶ 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

Name .

IP address TTL (in seconds)

MAC address DHCP profile

Host type Use SMTP

Comment

Responsible (name)

Responsible (mail)

Search for an IPv4 block

IPv4 network

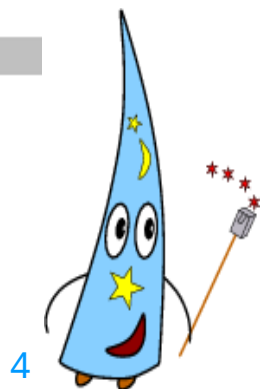
Address count

or

Add alias





Alias name .

Host .



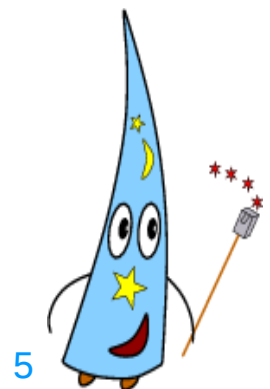
IPv4 address map

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

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

237 available addresses / 256 total [\[Detail\]](#)

172.16.1.0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
172.16.1.16	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
172.16.1.32	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
172.16.1.48	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
172.16.1.64	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
172.16.1.80	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
172.16.1.96	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
172.16.1.112	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
172.16.1.128	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
172.16.1.144	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
172.16.1.160	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
172.16.1.176	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
172.16.1.192	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
172.16.1.208	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
172.16.1.224	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
172.16.1.240	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255



Topology: L2

Enter an equipment

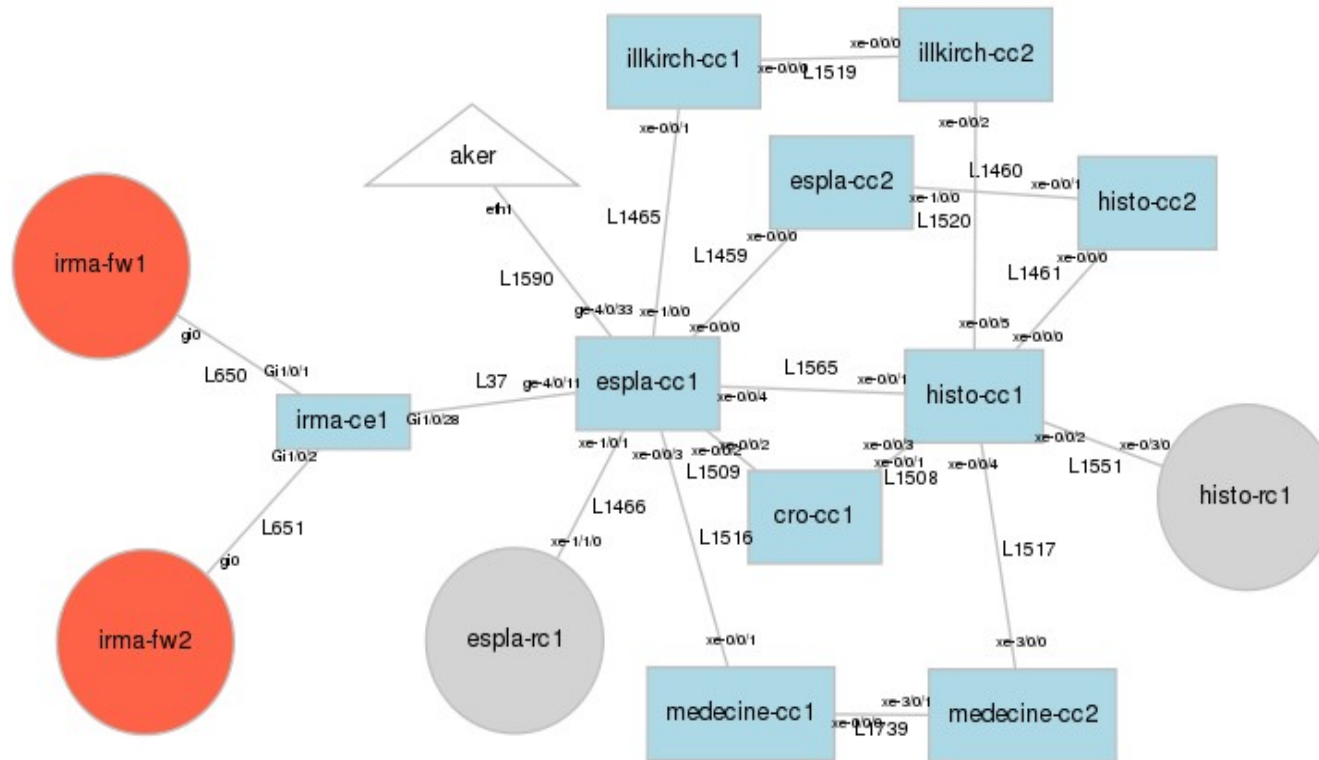
Display

Enter a VLAN

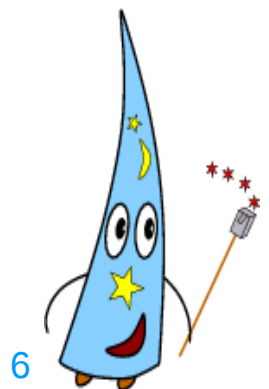
Display

Enter an IP address

Display



Vlan 33 : rch ulp irma



Topology: L3

Enter an equipment

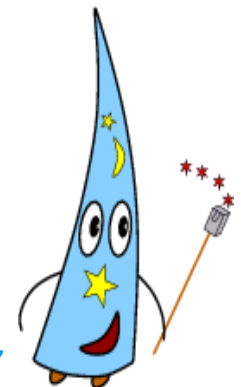
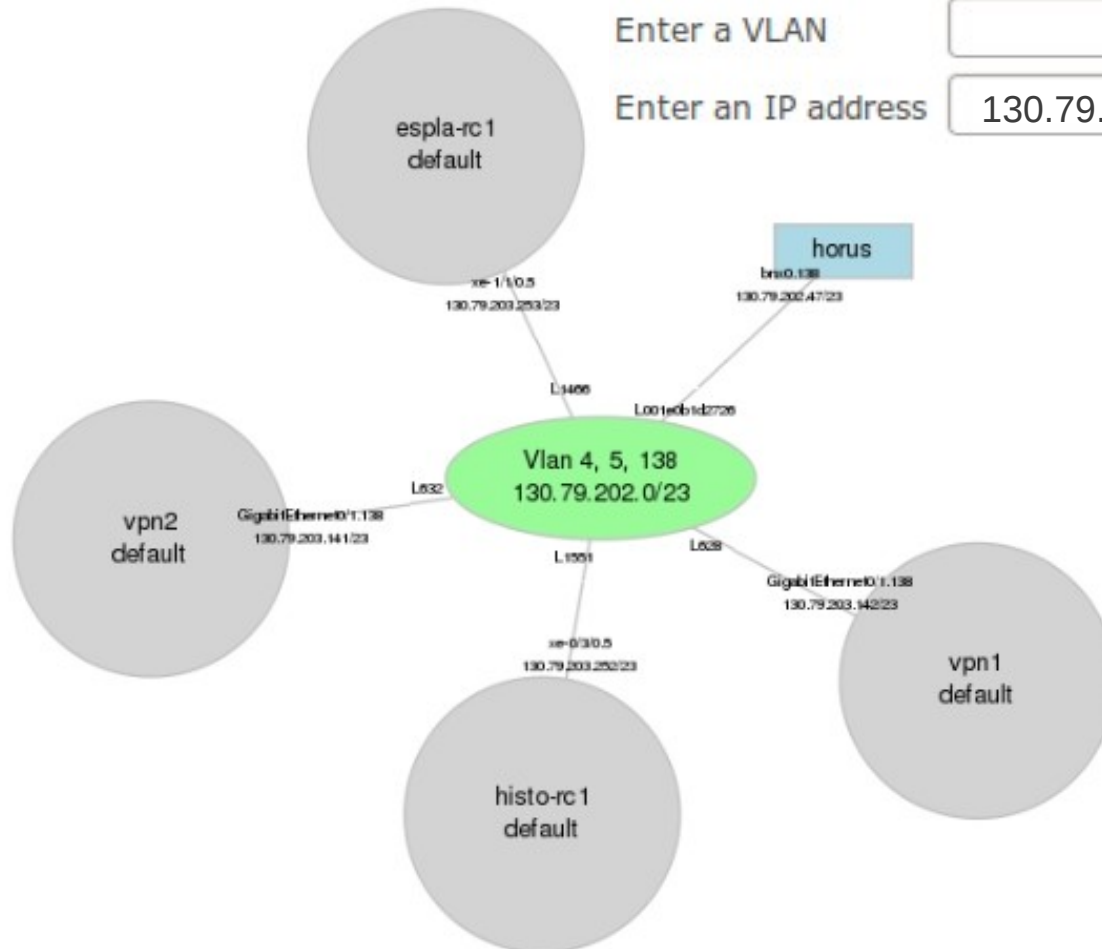
Display

Enter a VLAN

Display

Enter an IP address

Display



Topology: network equipments

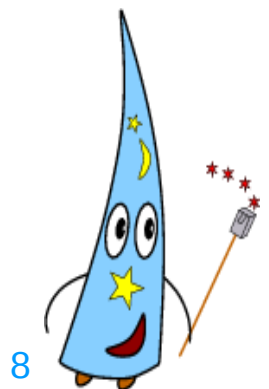
Enter an equipment 

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)
- GigabitEthernet0/1 [\[Traffic\]](#) Trunk L1 to [jnetmaq ge-0/0/0](#)
Vlan [2000 \(management vlan\)](#)



Topology: interface modification

Edit interface FastEthernet0/4 on cnetmaq

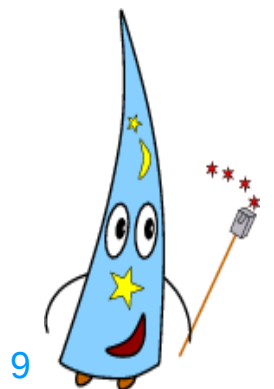
Description

VLAN

Sensors

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

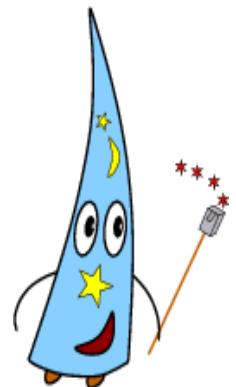
Enter an equipment

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)
- GigabitEthernet0/1 [\[Trafic\]](#) trunk L1 to [jnetmaq ge-0/0/0](#)
Vlan [2000 \(management vlan\)](#)

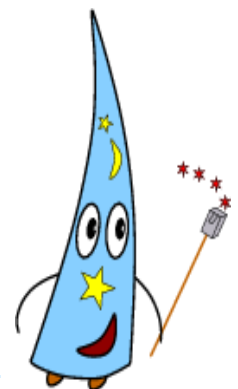
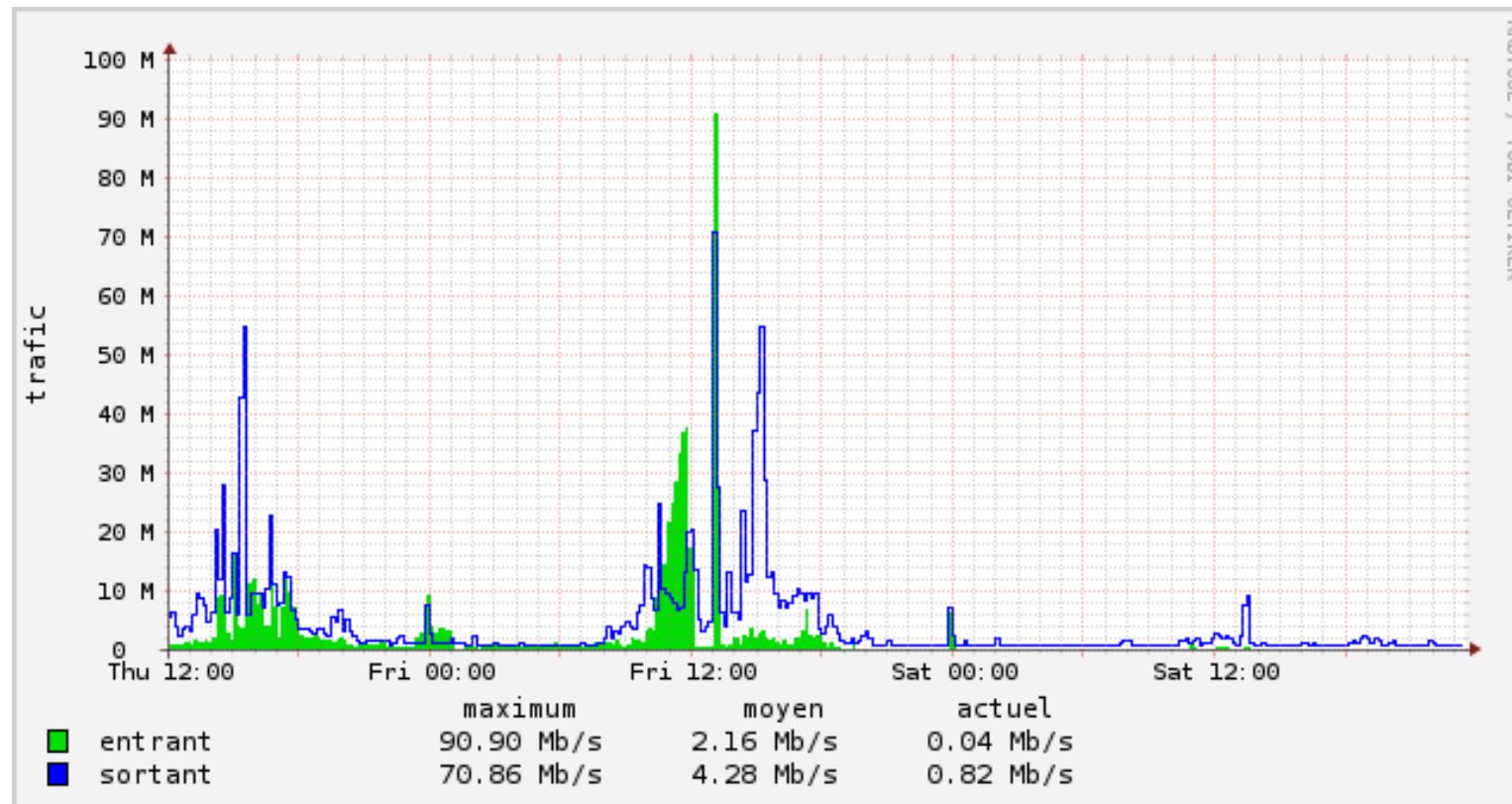


Topology: traffic on an interface

Traffic on interface GigabitEthernet0/1 of cnetmaq

Display data between at h and at h

Traffic on interface GigabitEthernet0/1 of cnetmaq



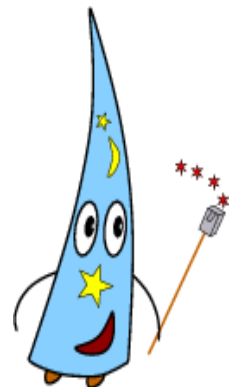
MAC: locate an IP address

2 associations IP-MAC trouvées pour 130.79.6.1 :

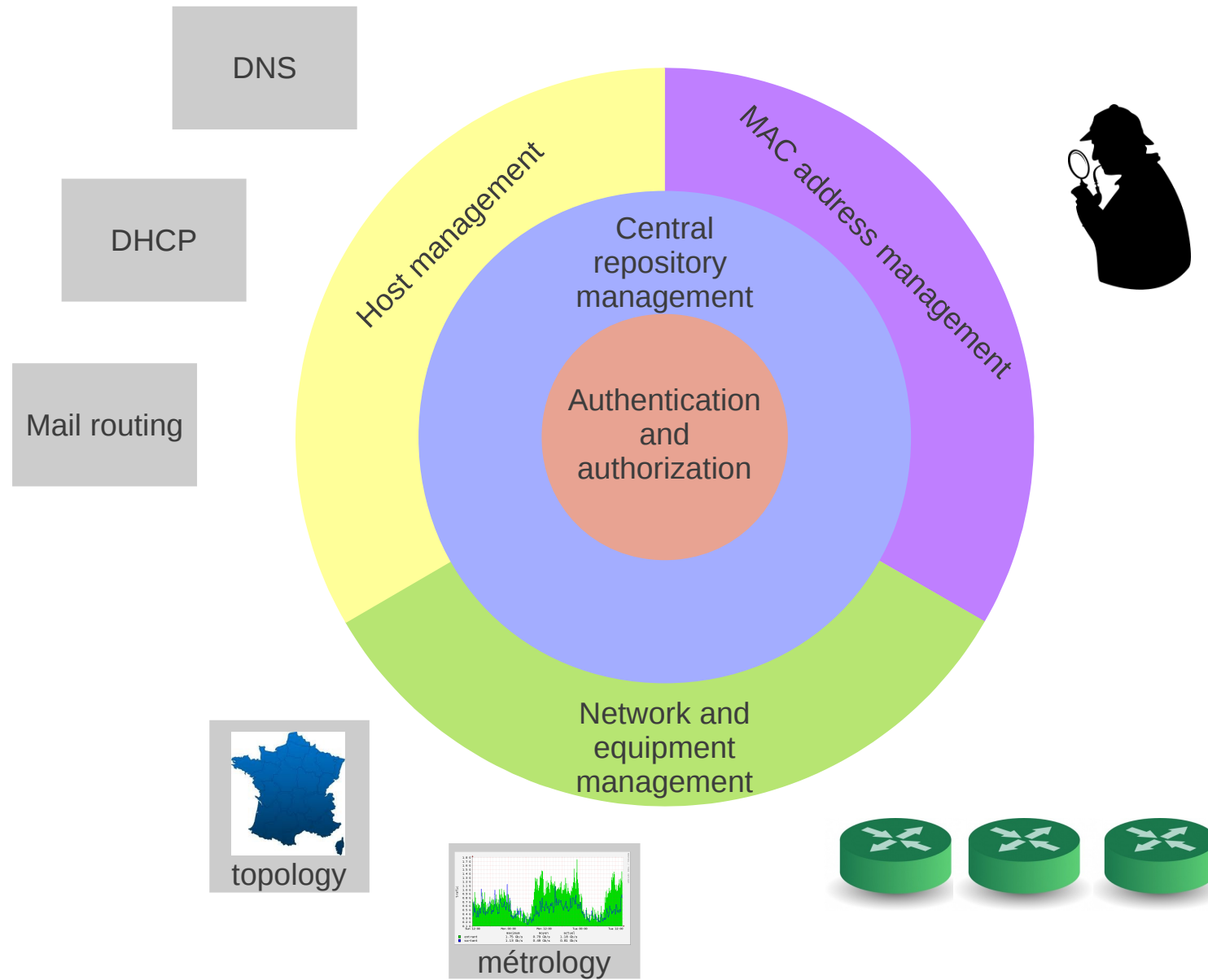
Sessions	Adresse IP	Adresse MAC	Dernière occurrence
Détails	130.79.6.1 (res-a.u-strasbg.fr.)	00:1c:c0:5a:d9:04	(date effacée)
Détails	130.79.6.1 (res-a.u-strasbg.fr.)	00:17:31:c1:c7:63	22/10/2010 18:01:08

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

Sessions	Adresse IP	Adresse MAC	Dernière occurrence
Détails	2001:660:4701:2001::1 (res-a.u-strasbg.fr.)	00:09:3d:12:8a:af (Newisys,Inc.)	(date effacée)



Functional domains

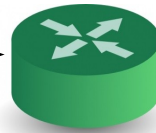


Configuration-driven automation

Network administrator

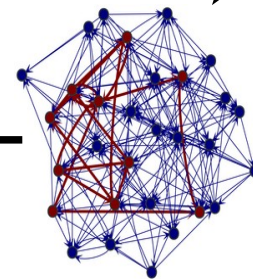
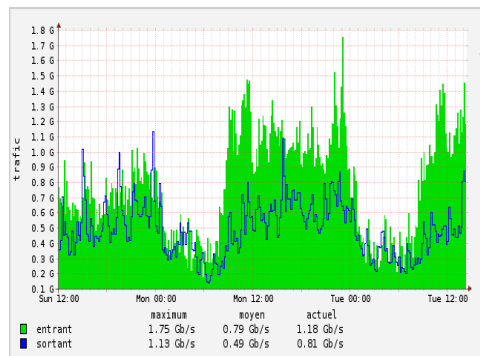


Configuration modification

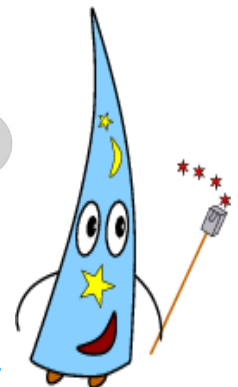
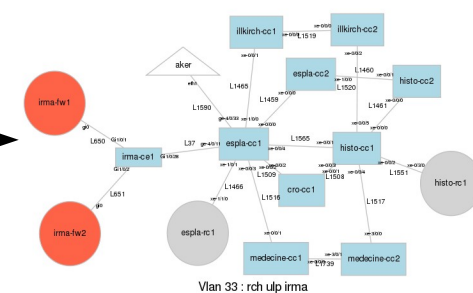


Download

Topology server



Model of the network



Configuration-driven automation

A simple modification in the configuration of a network equipment:

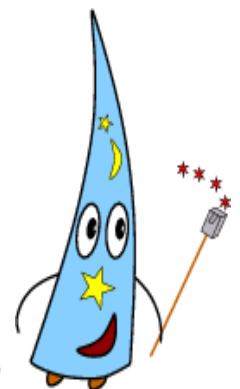
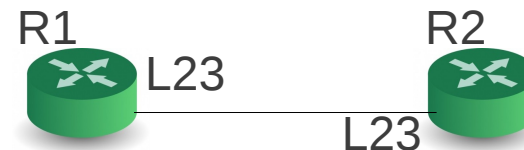
add (link number, sensor number) in the interface description:



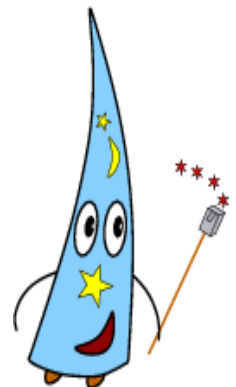
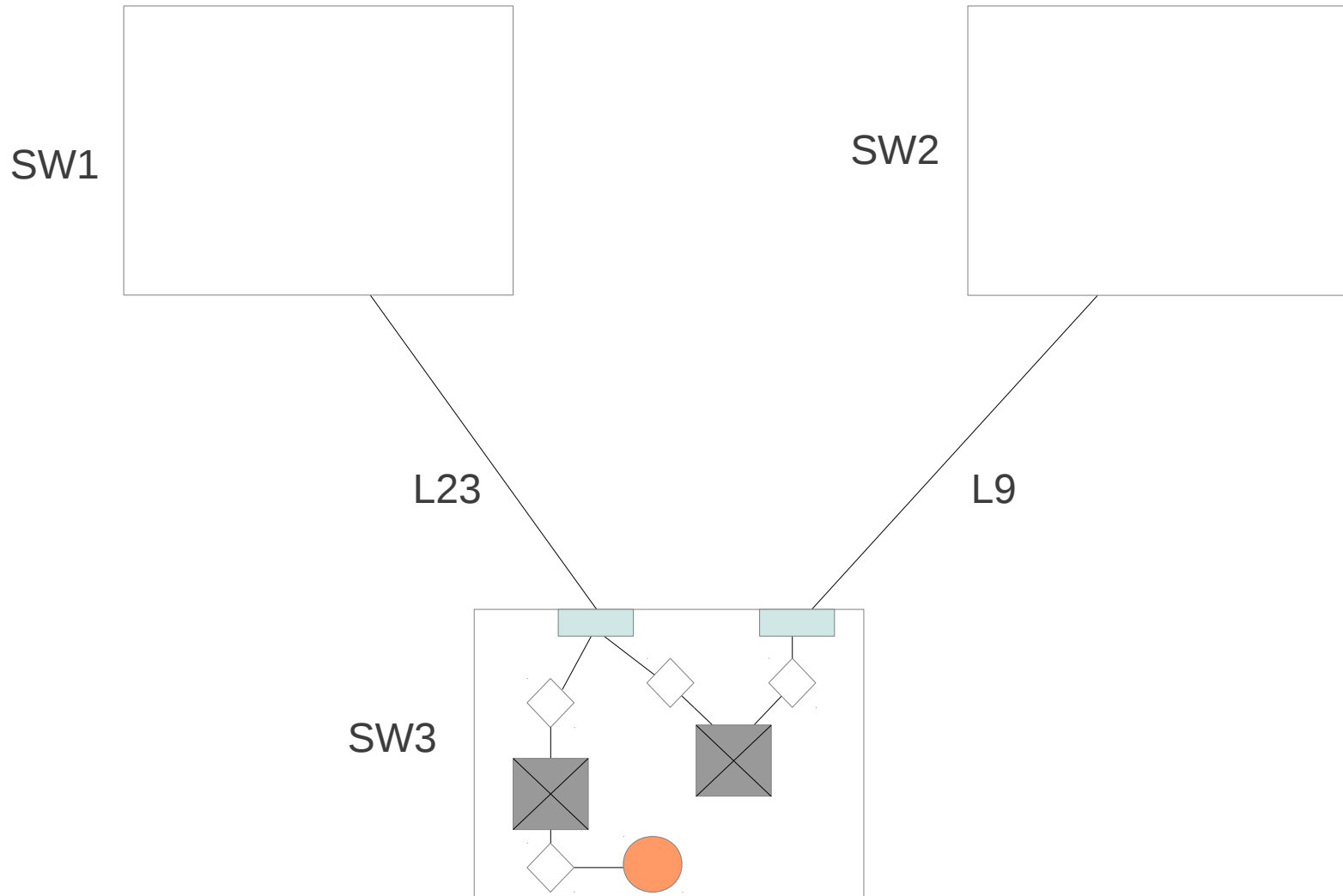
```
interface Gi0/23
description <L23 M23>
```

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

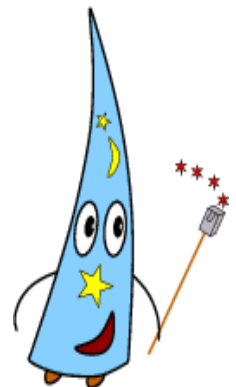
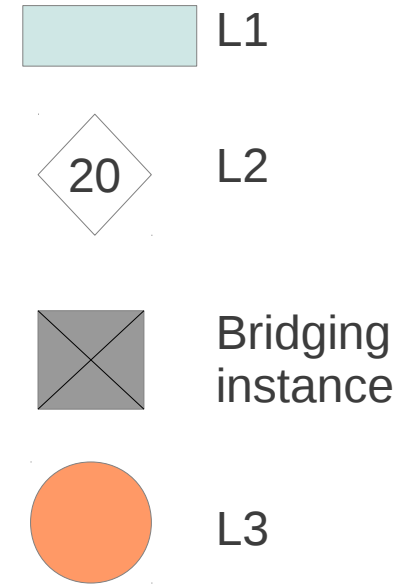
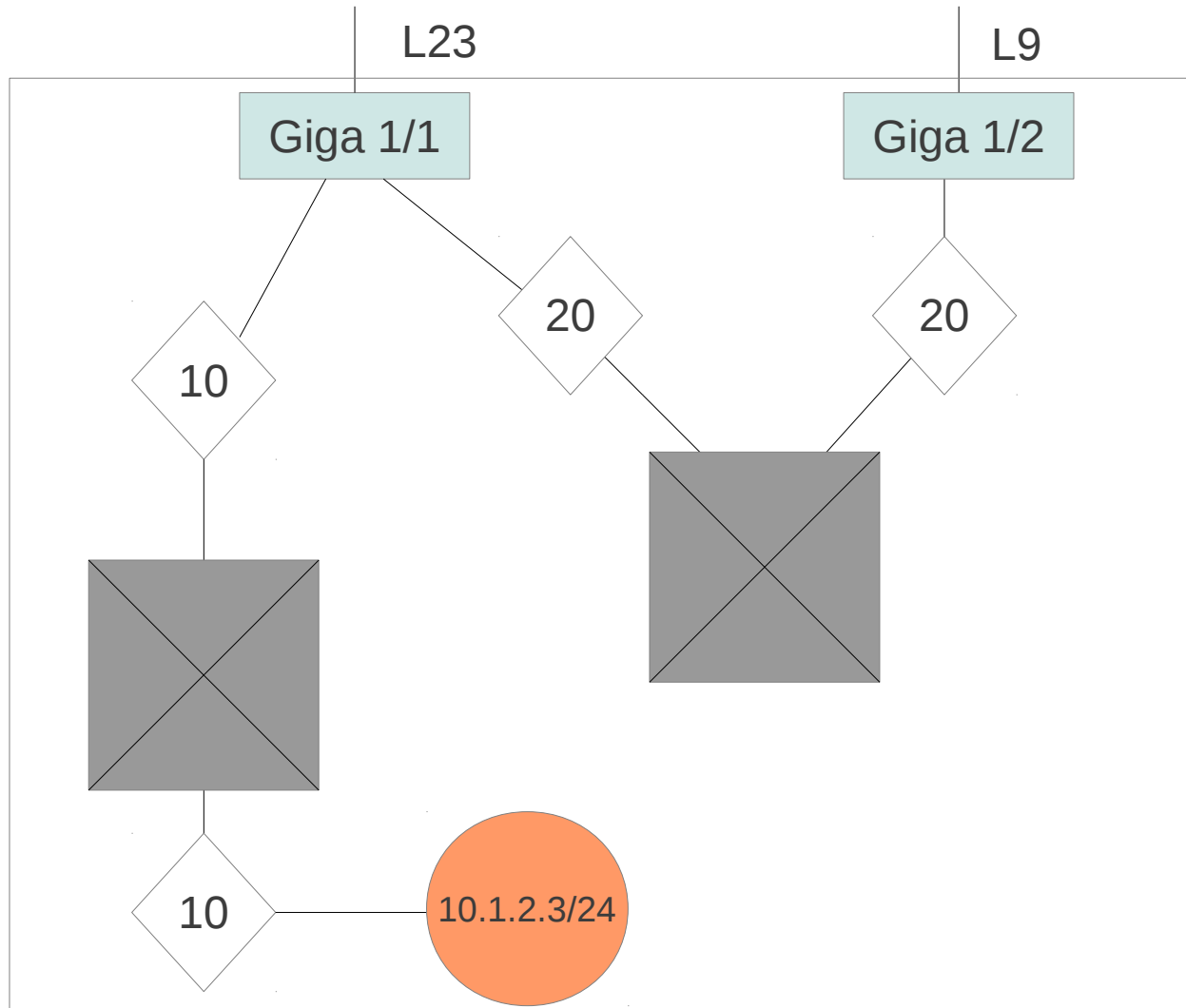
- Analysis of the configuration
- Matching identical link numbers
- Building of a (highly detailed) network model
- Automatic generation of traffic sensors
- SNMP polling and creation of an RRD database



Network model

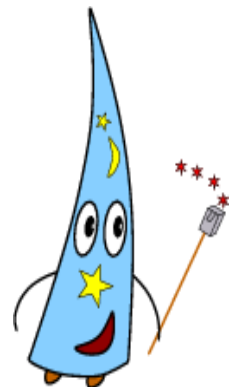


Network model



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/>

