Juniper in – Cisco out

Infrastructure équipements actifs du réseau de l'IRMA
Évolution Cisco/vieux vers Juniper/jeune

X/Stra - 23/02/12

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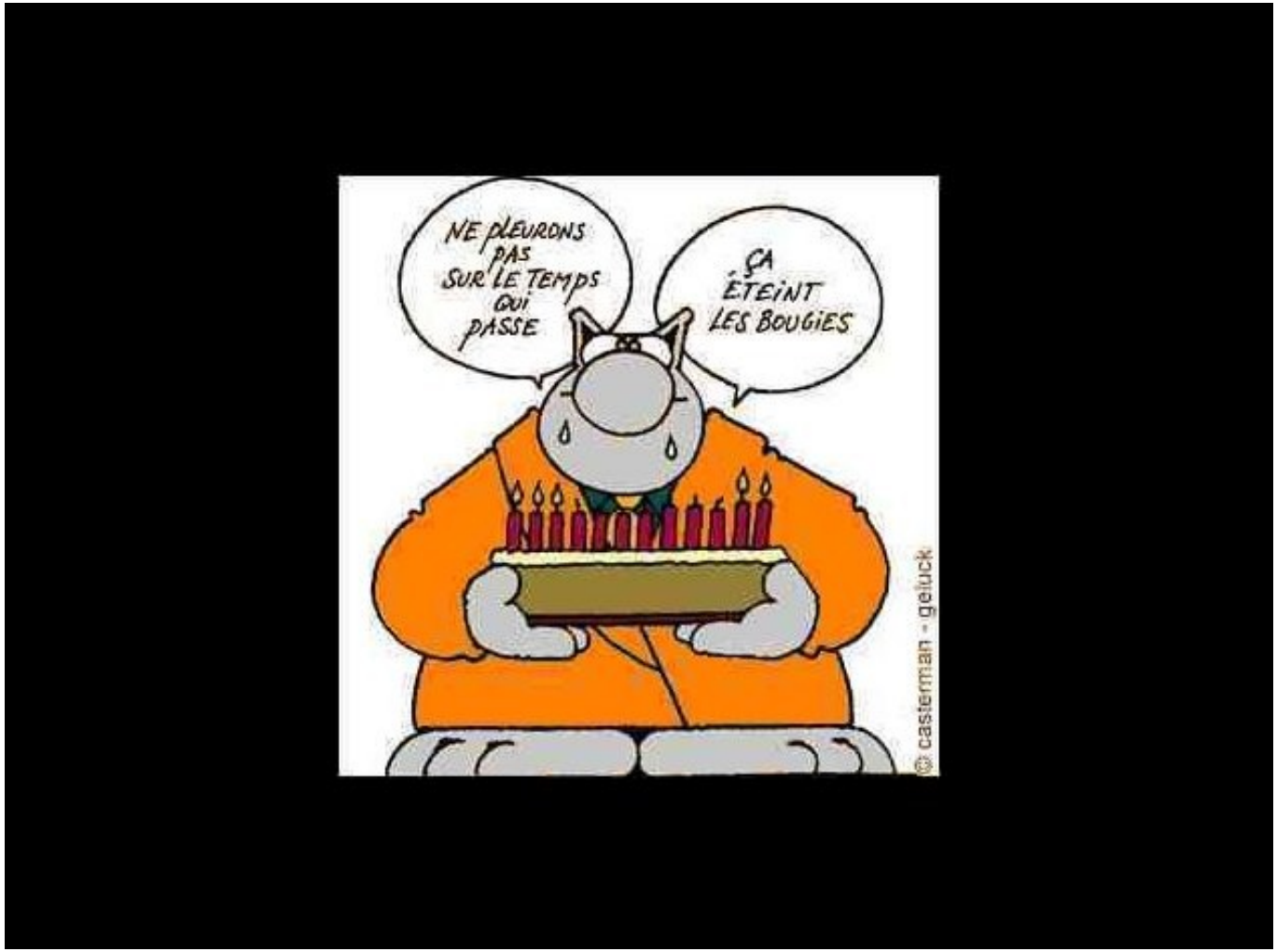
Bon anniversaire Fréddie...



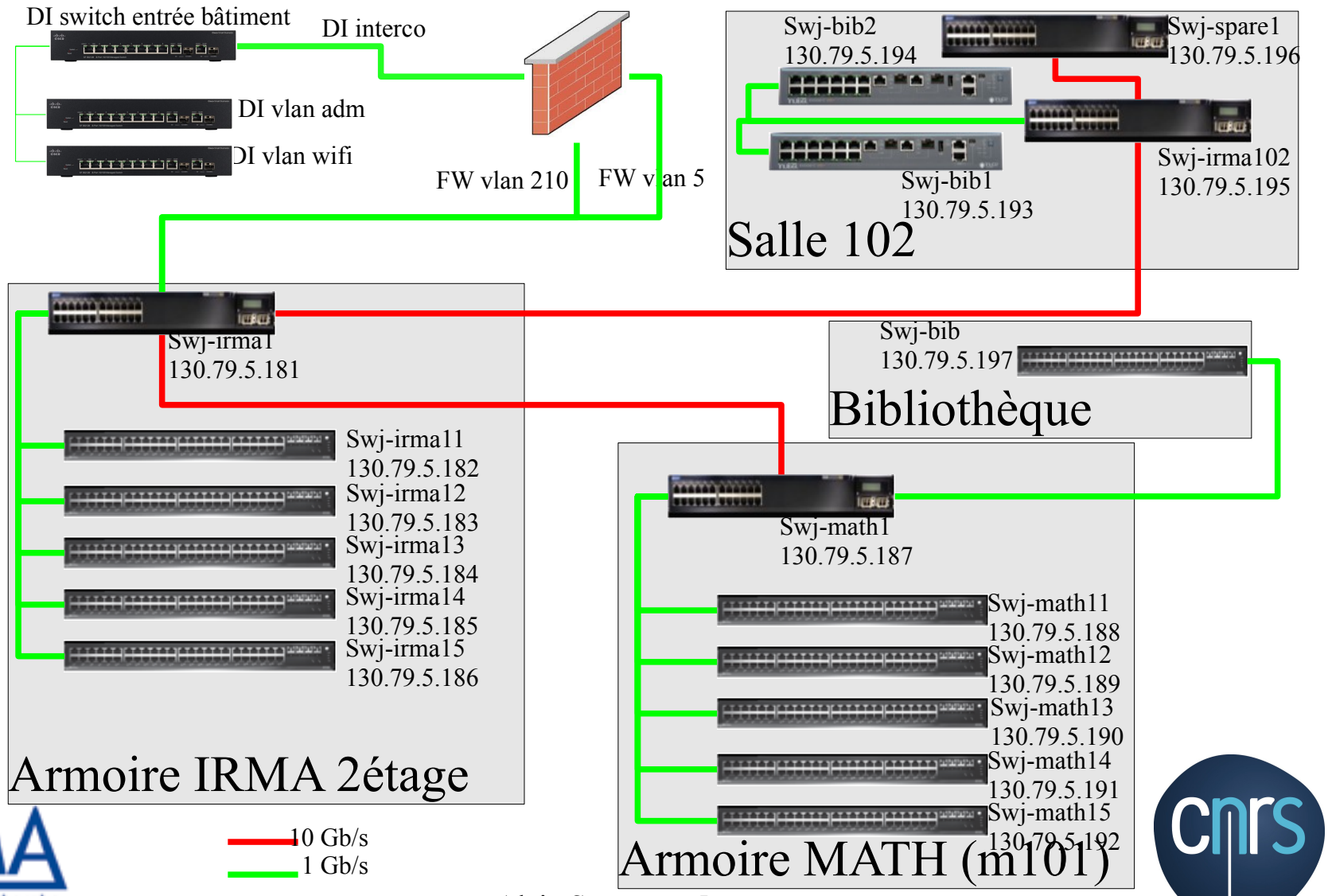
Pourquoi changer

- Équipements Cisco vieillissants
- Taux de panne +/- important
- Plus de garantie sur le matériel
- Ports 100 Mb/s
- Backbone et certains liens saturés par moment

Pourquoi Juniper

- Marchés UdS
- Équipements rapport coût/perf ++
- Achat fin 2011 rapide → reliquats :-)
- 10Gb/s backbone
- 1Gb/s dans les bureaux
- Garantie à vie !

Plan du réseau



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Matériel

- Juniper 4200 – 48 ports Gb – 2 ports 10Gb cluster possible
- Juniper 2200 – 48 ports Gb
- Juniper 2200C – 12 ports Gb fanless :-)

Administration :
« command line interface » + « Web mgmt »

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CLI

Exemple :

```
configure
set system host-name swj-bib2
set system time-zone Europe/Paris
set system ntp server 130.79.14.177
set system domain-name u-strasbg.fr
set system name-server 130.79.200.200
set system domain-search u-strasbg.fr
set system root-authentication encrypted-password $1$zSwUGHmS$E8gFoZARh7JNuVVpTlaJo0
set system services ssh root-login allow
edit system services web-management http
commit
top
edit interfaces vlan unit 0 family inet
set address 130.79.5.194/23
top
edit vlans default
set l3-interface vlan.0
commit
exit
```

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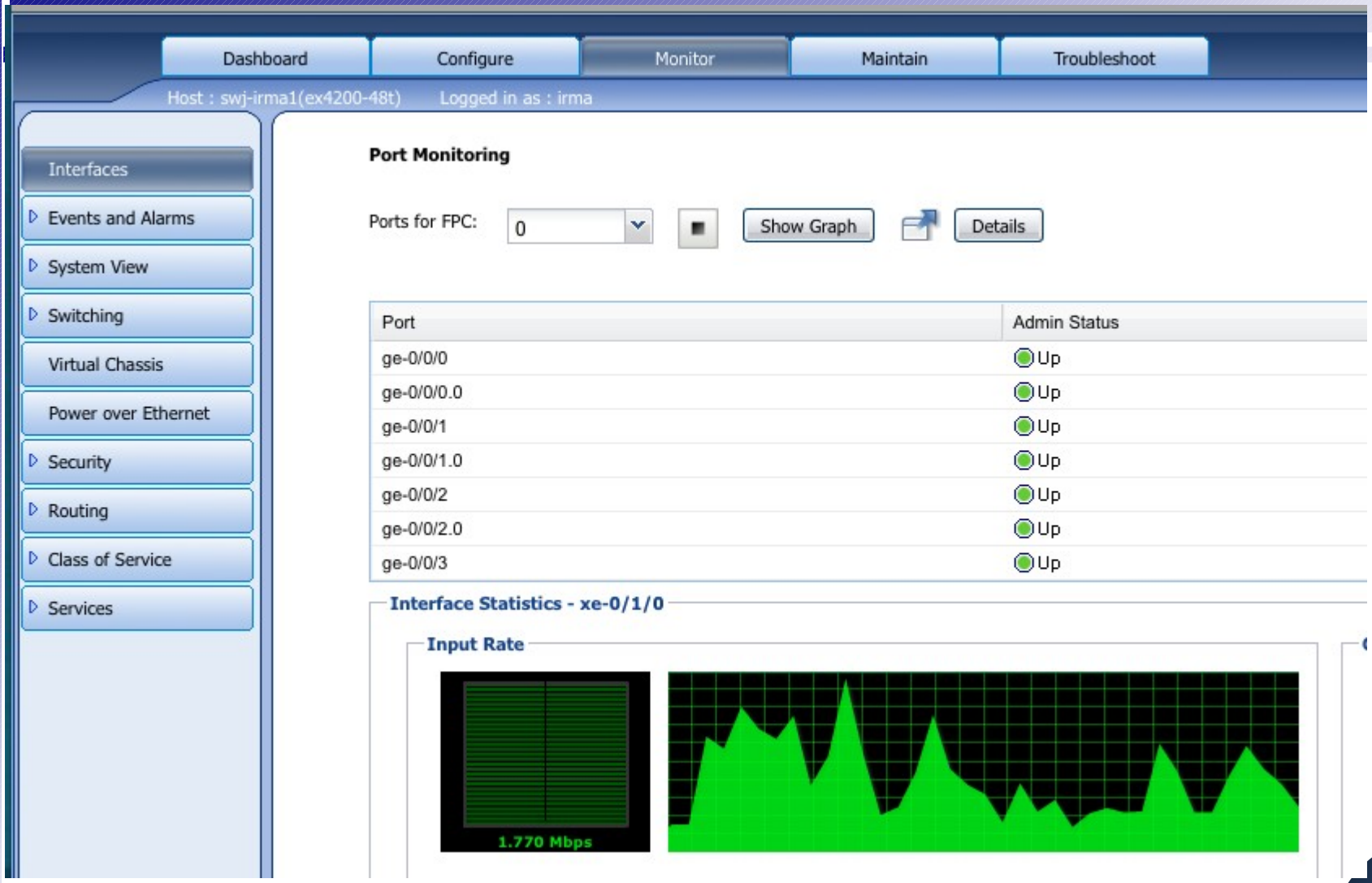
WEB


Dashboard
Configure
Monitor
Maintain
Troubleshoot
Host : swj-irma1(ex4200-48t)
Logged in as : irma
Interfaces
Events and Alarms
System View
Switching
Virtual Chassis
Power over Ethernet
Security
Routing
Class of Service
Services
Port Monitoring
Ports for FPC:
0
Show Graph
Details
Port
Admin Status
ge-0/0/0
Up
ge-0/0/0.0
Up
ge-0/0/1
Up
ge-0/0/1.0
Up
ge-0/0/2
Up
ge-0/0/2.0
Up
ge-0/0/3
Up
Interface Statistics - xe-0/1/0
Input Rate
1.770 Mbps

Méthodologie

- Montage d'une maquette
- Prise en main et paramétrage
- Script pour envoyer commande ou un fichier de conf à tous ou une sélection de switch
- Script backup configuration → crontab
- Supervision dans NAGIOS
- Monitoring dans CACTI

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Mise en production

- Ajout progressif des Juniper 2200 dans les armoires et câblage – retrait des Cisco 2950
- Pose des Juniper 4200 pour le backbone en parallèle
- Bascule du nouveau backbone et câblage des serveurs – étape avec interruption de service !
- Suppression ancien backbone

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Nagios

swj-irma1	CPUload	OK	02-10-2012 14:57:02	18d 4h 54m 46s	1/3	SNMP OK - 12
	FAN1	OK	02-10-2012 14:58:28	0d 0h 3m 20s	1/3	SNMP OK - 2
	FAN2	OK	02-10-2012 15:01:20	0d 0h 20m 28s	1/3	SNMP OK - 2
	FAN3	OK	02-10-2012 14:54:48	0d 0h 37m 0s	1/3	SNMP OK - 2
	MemoryBufferUsage	OK	02-10-2012 14:52:12	18d 22h 59m 36s	1/3	SNMP OK - 36
	PING	OK	02-10-2012 14:58:38	18d 4h 58m 10s	1/4	PING OK - Paquets perdus = 0%, RTA = 1.21 ms
	PowerSupply_1	OK	02-10-2012 14:57:04	18d 4h 54m 44s	1/3	SNMP OK - 2
	PowerSupply_2	OK	02-10-2012 14:56:29	18d 4h 55m 19s	1/3	SNMP OK - 2
	RedAlarmLed	OK	02-10-2012 14:59:21	18d 4h 52m 27s	1/3	SNMP OK - 2
	Temperature	OK	02-10-2012 15:00:48	18d 4h 51m 1s	1/3	SNMP OK - 41
	Uptime	OK	02-10-2012 14:52:13	18d 22h 59m 35s	1/3	SNMP OK - Timeticks: (173494288) 20 days, 1:55:42.88

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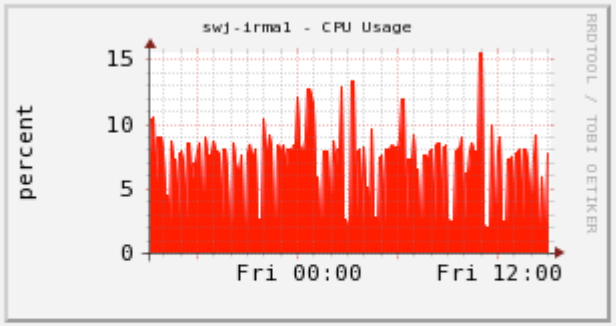
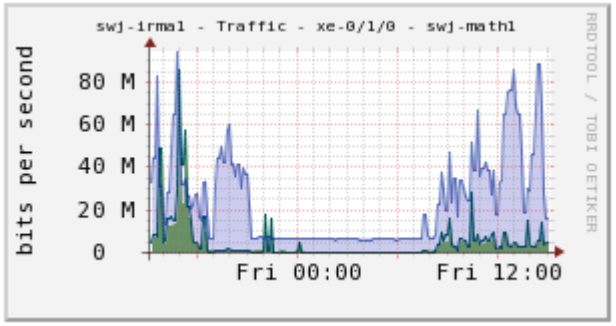
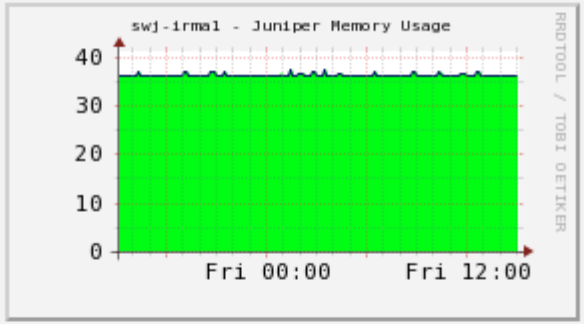
Cacti

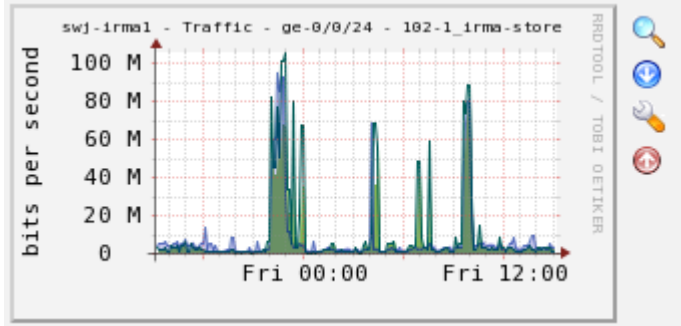
Graph Template: Juniper EX - CPU Usage



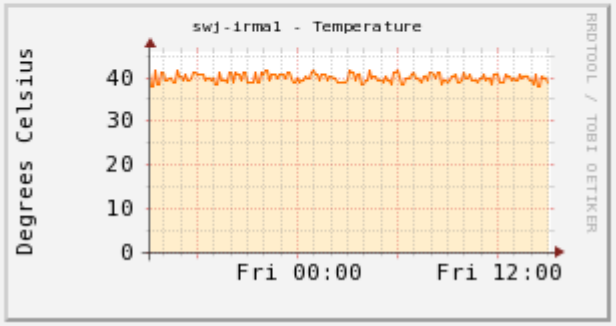


Graph Template: Juniper EX - Memory Usage





Graph Template: Juniper SRX - Temperature



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Problème agrégation de liens

- Agrégation de lien sous unix (bonding) – chargement du module :

```
# more /etc/modprobe.d/bonding.conf

alias bond0 bonding
```

Les différents mode

Mode		Description	Load-Balancing
0	balance-rr	l'équilibrage de charges	round-robin policy
1	active-backup	la sauvegarde active	aucune mais failover
2	balance-xor	la balance Xor	entrante
3	broadcast	diffuse sur toutes les if	aucune
4	802.3ad	norme lacp	E/S + switch 803.3ad
5	balance-tlb	Transmit Load Balancing	entrante
6	balance-alb	Active Load Balancing	entrante et sortante

Configuration bond0

```
more /etc/sysconfig/network-scripts/ifcfg-bond0

DEVICE=bond0
IPADDR=192.168.1.6
NETMASK=255.255.255.0
BROADCAST=192.168.1.255
ONBOOT=yes
BOOTPROTO=none
USERCTL=no
#BONDING_OPTS="mode=4 miimon=100 lacp_rate=1 \
xmit_hash_policy=1 ad_select=2"
BONDING_OPTS="mode=6 miimon=100"
```

Configuration des interfaces liées à bond0

```
# more /etc/sysconfig/network-scripts/ifcfg-eth2
DEVICE="eth2"
ONBOOT=yes
BOOTPROTO=none
USERCTL=no
MASTER=bond0
SLAVE=yes

# more /etc/sysconfig/network-scripts/ifcfg-eth3
DEVICE="eth3"
ONBOOT=yes
BOOTPROTO=none
USERCTL=no
MASTER=bond0
SLAVE=yes
```

Vérification

```
# cat /proc/net/bonding/bond0
Ethernet Channel Bonding Driver: v3.6.0

Bonding Mode: IEEE 802.3ad Dynamic link aggregation
Transmit Hash Policy: layer2 (0)
MII Status: up
MII Polling Interval (ms): 100
Up Delay (ms): 0
Down Delay (ms): 0

802.3ad info
LACP rate: slow
Aggregator selection policy (ad_select): stable
Active Aggregator Info:
        Aggregator ID: 1
        Number of ports: 1
        Actor Key: 17
        Partner Key: 1
        Partner Mac Address: 00:00:00:00:00:00

Slave Interface: eth2
MII Status: up
Speed: 1000 Mbps
Duplex: full
Link Failure Count: 2
Permanent HW addr: 78:e3:b5:0e:7f:94
Aggregator ID: 1
Slave queue ID: 0

Slave Interface: eth3
MII Status: up
Speed: 1000 Mbps
Duplex: full
Link Failure Count: 3
Permanent HW addr: 78:e3:b5:0e:7f:96
Aggregator ID: 2
Slave queue ID: 0
```

Ifconfig

```
# ifconfig
bond0     Link encap:Ethernet  HWaddr 78:E3:B5:0E:7F:94
          inet adr:192.168.1.6  Bcast:192.168.1.255  Masque:255.255.255.0
          adr inet6: fe80::7ae3:b5ff:fe0e:7f94/64 Scope:Lien
          UP BROADCAST RUNNING MASTER MULTICAST  MTU:1500  Metric:1
          RX packets:10239021 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1048320 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 lg file transmission:0
          RX bytes:15098148036 (14.0 GiB)  TX bytes:77689132 (74.0 MiB)

eth0      Link encap:Ethernet  HWaddr 3C:D9:2B:FE:D5:84
          inet adr:130.79.5.80  Bcast:130.79.5.255  Masque:255.255.254.0
          adr inet6: fe80::3ed9:2bff:fefe:d584/64 Scope:Lien
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:450825 errors:0 dropped:0 overruns:0 frame:0
          TX packets:9882 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 lg file transmission:1000
          RX bytes:54983955 (52.4 MiB)  TX bytes:7990814 (7.6 MiB)
          MÃ©moire:fbe60000-fbe80000

eth2      Link encap:Ethernet  HWaddr 78:E3:B5:0E:7F:94
          inet adr:192.168.1.6  Bcast:192.168.1.255  Masque:255.255.255.0
          UP BROADCAST RUNNING SLAVE MULTICAST  MTU:1500  Metric:1
          RX packets:10235604 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1045263 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 lg file transmission:1000
          RX bytes:15097716204 (14.0 GiB)  TX bytes:77298403 (73.7 MiB)
          Interruption:16 MÃ©moire:f6000000-f6012800

eth3      Link encap:Ethernet  HWaddr 78:E3:B5:0E:7F:96
          inet adr:192.168.1.6  Bcast:192.168.1.255  Masque:255.255.255.0
          UP BROADCAST RUNNING SLAVE MULTICAST  MTU:1500  Metric:1
          RX packets:3417 errors:0 dropped:0 overruns:0 frame:0
          TX packets:3057 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 lg file transmission:1000
          RX bytes:431832 (421.7 KiB)  TX bytes:390729 (381.5 KiB)
          Interruption:17 MÃ©moire:f8000000-f8012800
```

Bug en LACP → balanced-alb

- Failover OK -
- Load balancing – seule une seule interface fonctionne, l'autre reste en standby sur com entre deux systèmes !!!
- Test des différents modes, via switch ou en direct
- Le débit reste à 110 Mo/s :-(
- Solution ???

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