

GestióIP 2.2

IP network and IP address management

Documentation

v1.0

www.gestioip.net

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1 Introduction

GestióIP is a Web based IP network and IP address management tool. It features a front page with integrated search and filter functions for both networks and hosts. This lets you find information easily and quickly.

The basic functions of GestióIP are:

- easy usage and clear presentation of data
- quick-search and quick-filter for network and host information integrated in the first page
- extended-search for networks and hosts
- automatic update of all network addresses against the DNS with a check if the addresses answer to ping
- one-click-check if an IP address answers to ping and if it has a DNS entry
- split/join/scaling up/scaling down networks (host entries can be maintained)
- detects overlapping networks
- shows free network ranges
- script to import networks from SNMP enabled devices
- script to import a network list from an Excel file
- cron-scheduled update of the networks against DNS and OCS
- multilingual

2 Use

The concept of GestióIP is that every user introduces the information of user's field of responsibility which seems relevant for this user and/or for the colleagues. So the windows admin can put e.g. comments like PDC domain XYZ, BDC... The database admin can introduce the SIDs... and the network admin can mark the administrative interfaces of the firewalls and routers. If this is done, GestióIP can be much more than a simple networks and IP addresses overview. It's a knowledge base for the small things admin have to remind every day.

2.1 access

Open the following URL to access GestióIP:

http://server.your-domain.org/gestioip

rw default user: gipadmin

ro default user: gipoper

(see 4.2)

2.2 show networks

To show all networks, click the link "show network" on the left menu.

With the filters "Site" and "Category" you can for instance list all networks from site X or all the networks of the production environment.

2.3 list all IP addresses of a network

To list all IP address of a network, click over the corresponding network.

network	BM	Description	Site	Category	Comment	sync
10.0.1.0	29	sync FWs	Lond I	Prod	not routed	
10.0.1.8	29	sync LBs	Lond I	Prod	not routed	
192.168.0.0	24	frontends	Lond I	Prod		
192.168.1.0	25	backends	Lond I	Prod		x
192.168.1.128	25	application server	Lond I	Prod		x
192.168.4.0	24	TESTY	Lond I	Test		
192.168.5.0	26	virtual addresses	Lond I	Prod	defined in LBs	x
192.168.7.0	24	backup	Lond I	Prod		x
192.168.10.0	24	administrators	Lond I			
192.168.11.0	24	marketing	Berlin	Corp		
192.168.12.0	24	human resources	Berlin	Corp		

Networks with a bitmask smaller than the value of "smallest_bm" can not be listed (see 4.1). Default value: 22.

2.4 network search

GestióIP has two different search engines. The quick search and the advanced search.

The quick search function executes a search in the following database fields: Network (IP), Description and Comment. The search will be processed like "%search-string%". The search isn't case sensitive. By using search-string "192", GestióIP lists all networks with an ID containing "192". With search-string "dhcp", it lists all networks with descriptions or comments containing "dhcp".

The advanced search executes a search in specific database fields.

Network ID: * *

Description: * *

Site: ▼

Category: ▼

Synchronized: all only synchronized networks only no synchronized networks

to change/delete networks

You can search for instance all production networks which are not synchronized automatically (see 5) or all networks of site xy where the description contains "backup".

When the checkbox "to change/delete networks" is checked, the buttons to change, synchronize, split, clear and delete networks are shown within the search result.

2.5 host search

See network search (2.4).

Advanced search:

If the checkbox "exact match" behind the hostname field is checked, only hosts with hostname entries identical to the search string would be listed. If not, the search string would be processed like "%search_string%".

Example: search for "foo"

Result without marked checkbox: foo, foo1, foo.bar.com...

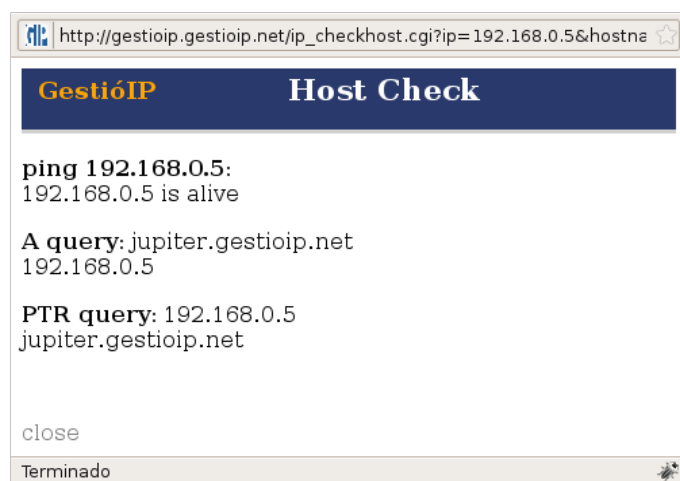
Result with marked checkbox: foo

2.6 IP address check with ping

Access the relevant network and click the IP address to be checked.

192.168.0.1	virt_fw1-fw2	Berl	<input type="button" value="edit"/>	<input type="button" value="delete"/>
192.168.0.2	fw1	Berl	<input type="button" value="edit"/>	<input type="button" value="delete"/>
192.168.0.3	fw2	Berl	<input type="button" value="edit"/>	<input type="button" value="delete"/>
192.168.0.4	---	Berl ---	<input type="button" value="edit"/>	
192.168.0.5	jupiter.gestioip.net	Berl	<input type="button" value="edit"/>	<input type="button" value="delete"/>
192.168.0.6	saturn.gestioip.net	Berl	<input type="button" value="edit"/>	<input type="button" value="delete"/>

GestióIP checks the IP with a ICMP echo request and executes a DNS PTR query. When the IP address has an PTR entry, GestióIP executes a DNS A query with the result of the PTR query.



3 Administration

3.1 administration of host entries/IP addresses

To administrate host entries/IP addresses, access the relevant network.

192.168.200.11	---	---	Berl	---	---	<input type="button" value="edit"/>	
192.168.200.12	switch1	network frontends	Berl	Switch	x floor -1	<input type="button" value="edit"/>	<input type="button" value="delete"/>
192.168.200.13	switch2	network frontends	Berl	Switch	x floor -1	<input type="button" value="edit"/>	<input type="button" value="delete"/>

3.1.1 insert or edit host entries

To insert or edit host entries, access the corresponding network and click "edit".

IP	Hostname	Description	Site	Category	AI	Comment	UT
192.168.0.5	<input type="text" value="jupiter.gestioip.net"/>	<input type="text"/>	Berl	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	dns <input type="button" value="change"/>

- **Hostname** – Name to identify the node. If a node has more than one interface it is advisable to introduce the same hostname for all IPs or to introduce the hostname in the comment field of all IPs of the node – so that the quick-search function finds all IPs of a node when searching for it's hostname - mandatory field
- **Description** – Short description of the node - optional field
- **Site** – Where the node physically is – mandatory field
- **Category** – Category of the node – optional field
- **AI (Administrative Interface)** – To mark the IP address to access the node (to administrate it) if the node has more than one network interface – optional field
- **Comment** – To point out whatever seems to be interesting regarding this node – optional field
- **UT (Update Type):** Only relevant if the automatic actualization is activated (see 5)
 - *man* – Entries which are marked as "man" will never be overwritten by the automatic actualization
 - *ocs* – For entries created by the automatic actualization against the OCS. Entries which are marked as "ocs" will not be overwritten by the automatic actualization against the DNS.
 - *dns* - For entries created by the automatic actualization against the DNS. Entries which

are marked as "dns" will be overwritten by the automatic actualization against the OCS and the actualization against the DNS.

- Entries with no update type are overwritten by the automatic actualization against the OCS and the DNS

NOTE

To prevent an entry from being overwritten by the automatic actualization, it must be classified as "man"

3.1.2 delete host entries

To delete host entries, access the corresponding network and click "delete".

3.2 network administration

3.2.1 new

To add a new network, click the link "new" on the left menu.

Network

24 (255.255.255.0 - 254 hosts) BM

Description

Comment

Site

Category

synchronized

save

- **Network** – ID of the network. e.g.: 192.168.0.0 – mandatory field
- **BM (bitmask)** – Bitmask of the network – mandatory field
- **Description** – Short description of the network – mandatory field
- **Site** – Where is the network “physically” located? (If the site field of the network is changed, the site field of the host entries of the network will be changed, too) – mandatory field

- **Category**- To categorize the network in e.g. production, pre-production, development – mandatory field
- **Comment** - Optional comment
- **sync** – To include the network into the automatic actualization (see 5) - optional field

3.2.2 change/delete networks

Click the link "change/delete" on the left menu to access the network manipulation form.

10.0.1.0	29	sync FWs	Berl	Prod	not routed	<input type="button" value="edit"/>	<input type="button" value="sync"/>	<input type="button" value="split"/>	<input type="button" value="clear"/>	<input type="button" value="delete"/>	
10.0.1.8	29	sync LBs	Berl	Prod	not routed	<input type="button" value="edit"/>	<input type="button" value="sync"/>	<input type="button" value="split"/>	<input type="button" value="clear"/>	<input type="button" value="delete"/>	
192.168.0.0	24	frontends	Berl	Prod		x	<input type="button" value="edit"/>	<input type="button" value="sync"/>	<input type="button" value="split"/>	<input type="button" value="clear"/>	<input type="button" value="delete"/>
192.168.1.0	25	backends	Berl	Prod		x	<input type="button" value="edit"/>	<input type="button" value="sync"/>	<input type="button" value="split"/>	<input type="button" value="clear"/>	<input type="button" value="delete"/>

3.2.2.1 edit

To edit the bitmask, description, site, category, comment or sync (synchronization) field.

Network	BM	Description	Site	Category	Comment	sync
192.168.5.0	<input type="text" value="26"/>	<input type="text" value="virtual addresses"/>	<input type="text" value="Berl"/>	<input type="text" value="Prod"/>	<input type="text" value="defined in LBs"/>	<input checked="" type="checkbox"/> <input type="button" value="change"/>

For description of the fields see 3.2.1.

3.2.2.2 sync

The function "sync" (network synchronization) is conceived to synchronize all IP addresses of a new network against the DNS. The network synchronization executes an ICMP echo request (ping) to all IP addresses and a DNS PTR query of all IP addresses of the network. If the address has a PTR entry the synchronization will create a new host entry. When the address does not answer to ping, a comment "does not respond to ping" will be added. When the IP address answers to ping but

does not have a PTR entry, the hostname is set to "unknown".

If the synchronization is launched against an network already containing host entries, the synchronization will only update IP addresses without entries. If an IP address already has a host entry, GestióIP reports only if the host entry matches the DNS entry for the IP address. It will not overwrite existing entries.

NOTE

To prevent the network from being filled with generic PTR entries (like 10-200-168-192.domain.org), configure the variable "ignorar" in the configuration file */DocumentRoot/priv/ip_config* (see 4.1)

Example: To avoid that a network is filled with generic PTR entries like 10-200-168-192.domain.org or 55-0-16-172.domain.org set the "ingore" variable to:

```
ignore=200-168-192,0-16-172  
networks.xls
```

3.2.2.3 split

To split networks into smaller subnets click over "split" on the left menu:

split network 192.168.11.0/24

bitmasks

Please introduce the bitmasks of the new range using the following format: **/bm1/bm2[/bm n]**

Example network 192.168.0.0/24:
bitmasks /25/25 -> 192.168.0.0/25, 192.168.0.128/25
bitmasks /26/27/27/25 -> 192.168.0.0/26, 192.168.0.64/27, 192.168.0.96/27, 192.168.0.128/25

When the "bitmasks" are correctly introduced, a list of the new subnets is shown. If the list is correct press "send" to split the network. If the bitmasks are incorrectly introduced a detailed error notification would be displayed.

split network 192.168.11.0/24

192.168.11.0/24 - /26/26/25

The network will be divided into the following subnets

192.168.11.0/26
192.168.11.64/26
192.168.11.128/25

If correct press "send"

 keep host entries

3.2.2.4 clear

Press "clear" to delete all the entries of a network.

3.2.2.5 delete

Click "delete" to delete the network and all of its entries.

3.2.3 join networks

To join networks click "join" on the left menu:

Mark two networks that should be joined and press ENTER or click "join" at the end of the page.

10.0.1.8	29	sync LBs	Berl Prod	not routed		<input type="checkbox"/>
192.168.0.0	24	frontends	Berl Prod		x	<input checked="" type="checkbox"/>
192.168.1.0	25	backends	Berl Prod		x	<input type="checkbox"/>
192.168.1.128	25	application server	Berl Prod		x	<input checked="" type="checkbox"/>
192.168.5.0	26	virtual addresses	Berl Prod	defined in LBs	x	<input type="checkbox"/>

The networks do not need to be consecutive. GestióIP suggests one way in which the networks could be joined. The suggestion can be accepted or the new range can be introduced manually. In case it is not possible to join the networks directly, GestióIP offers the possibility to introduce a new range manually.

The new range 192.168.0.0/23 (192.168.0.0-192.168.1.255) contains the following networks:

192.168.0.0/24
192.168.1.0/25
192.168.1.128/25

If correct press "join"

keep host entries

If not correct please insert the new range manually

3.2.4 show free ranges

To show an overview of the unused spaces between the existing networks click the link "show free ranges" on the left menu.

3.3 sites, host categories and network categories

To delete or to introduce sites, host categories or network categories, click over the corresponding link on the left menu.

4 Advanced functions

4.1 configuration file

The configuration of GestióIP is stored in **/DocumentRoot/priv/ip_config**

The database name and the credentials of the database user are stored in the configuration file. Therefore it is important to correctly configure the apache web server and to correctly set the

permissions of the configuration file (500). To check whether the apache2 web server is correctly configured, you can try to access with a browser the configuration of GestióIP. Open the following URL with a browser.

http://gestioip.your-domain.org/priv/ip_config

You should receive an "access denied". In case it is possible to access the file ip_config, check the configuration of apache2.

Configuration parameter description:

parameter	description	default value
bbdd_host	Host where the GestióIP mysql database runs	127.0.0.1
bbdd_port	Port on which the database listens	
sid_gestioip	SID of the GestióIP database	gestioip
user_gestioip	GestióIP database user	gestioip
pass_gestioip	GestióIP database user password	-
max_sinc_procs	The maximal number of processes to fork when synchronizing a network (ip_sincred.cgi)	254
smallest_bm	Networks with smaller bitmasks than the vale of smallest_bm can't be listed and doesn't contain host entries.	22
ignorar	String to be ignored when synchronizing a network. This parameter prevents the unused IP addresses from being updated with generic DNS PTR entries when synchronizing a network (see 3.2.2.2 for an example)	-

4.2 access control

The access control of GestióIP is made through mod_auth of the apache web server.

The ro-user (e.g. gipoper) has access to the front page with the network overview as well as to the network views and the search and filter functions. When the ro-user tries to access a manipulation

form (all located in DocumentRoot/gestioip/res/) the user receives a server error 404 – "access denied".

The rw-user (e.g. gipadmin) has access to all features of GestióIP:

4.3 Database initialization

Gestioip comes with two scripts which fill automatically the database with your networks.

Both script are located in the directory "script" of the GestióIP tarball.

4.3.1 import networks via SNMP

The script `get_networks_snmp.pl` queries the routing tables of different network nodes via SNMP and creates the database entries for GestióIP from the query results.

You need to configure the GestióIP database parameter directly in the script. Open the script `get_networks_snmp.pl` with your favorite editor and make the changes between the lines "change from here" "...to here".

`get_networks_snmp.pl` reads it's target nodes from a file called `snmp_targets`. Open the file and enter the nodes that should be queried (one host per line).

The script depends on the following Perl modules:

SNMP, Net::IP, DBI

If you get an error message as "Can't locate SNMP.pm in @INC ..." when executing the script you have to install the missing Perl module.

Download the missing modules from CPAN (<http://search.cpan.org>) and install them using the following commands:

```
$ tar vzxvf module.tar.gz/unzip module.zip
$ cd module
$ perl Makefile.pl
$ make
$ sudo make install
```

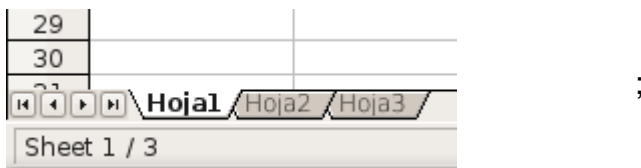
Then execute `get_networks_snmp.pl` from command line.

4.3.2 import networks from a MS Excel file

The script `import_from_excel.pl` imports a network list from a MS Excel file into the database of GestióIP.

The script comes with no configuration file. So you have to configure the database parameters directly in the script. In order to do this open the file `import_networks_from_excel.pl` with your favorite editor and edit the variables between the "change from here" "...to here". The variable `$excel_sheet_name` stands for the name of the sheet which you find below in the left corner of your file. In the image below the variable would be set to:

my \$excel_sheet_name="Hoja1".



The Excel file working with the script has the following format:

	A	B	C	D	E	F
1	network	bitmask or subnetmask	description	site	category	comment
2						
3	192.168.0.0	24	some description	Lond I		
4	192.168.1.0	24		Lond I	Prod	
5	192.168.2.0	255.255.255.0			Dev	
6	192.168.3.0	24	some description	Barcel	Pre	
7	xxxxxxxxxxx			Barcel	Pre	
8	192.168.4.0	27				
9						
10	192.168.5.0	25	some description			some comment
11	192.168.5.128	255.255.255.128	some description	Lond I		
12	10.0.10.0	24		Lond I		

To use the script with your network list copy the network and bitmask/subnetmask column from your network list and paste it into a new Excel file. Bitmasks/subnetmasks will be both accepted. The columns description, site, category and comment are optional. sites and categories must be the same as the sites and categories of GestióIP (or they would be ignored).

Call the new file networks.xls and copy it to the directory where the script import_networks_from_excel.pl is.

The script depends on the following Perl modules:

Spreadsheet::ParseExcel, Net::IP, DBI

If you get an error message as "Can't locate Spreadsheet/ParseExcel.pm in @INC ..." when executing the script you have to install the missing Perl module (see 4.3.1).

Then execute import_networks_from_excel.pl from the command line.

NOTE

Until now the script does not has a filter mechanism for forbidden characters. If you use special characters in the description field you may get a "character not allowed" message when editing the network entry over the frontend of GestióIP. If so, delete the special character when editing the entry.

4.4 add a new language

Currently GestióIP supports the following languages: Catalan, Spanish, German and English.

GestióIP possesses a system that makes it easy to add new languages:

Make a copy of one of the language files (e.g. /DocumentRoot/vars/vars_en) and name it vars_xy (replace the xy with the abbreviation of the new language – for French "vars_fr", for Danish "vars_dk". The abbreviation must contain two or three characters) and open it with your favorite editor. In the file you find variables such as:

name_of_the_variable=value of the variable

example file /DocumentRoot/vars/vars_en

mostrar_redes_message=show networks

mostrar_red_message=show network

busqueda_detallada_message=advanced search

crear_red_message=create new network

llenar_red_message=synchronize network

Translate the text starting at the right of the "="

Special characters should be introduced html encoded (ú -> ú)

Copy the flag icon (19x12px) that stands for the new language to

/DocumentRoot/imagenes/bandera_xy (replace the xy with the abbreviation of the new language).

Check the owner and the permissions of the files vars_xy and bandera_xy.

And...

Send the new language file and the flag icon to contact@gestioip.net. It would be a pleasure to add your language to GestióIP!

5 Automatic actualization (ip_update_gestioip.pl)

GestióIP comes with a script (β) which automatically updates the database of GestióIP against the DNS and against OCS 1.01. It's recommended to make a copy of the database before executing the script in production (mysqldump -u gestioip -p gestioip > dump_gestioip.sql).

The automatic actualization processes only networks with checked "sync" field (see 3.2.1).

Create a cronjob to execute the script automatically (see 5.3).

5.1 command line options

```
$ ./ip_update_gestioip.pl
```

```
usage: ip_update_gestioip.pl [OPTIONS...]
```

-o, --ocs	update against OCS
-d, --dns	update against DNS
-a, --all	update against OCS y DNS
-v, --verbose	verbose
-l, --log=logfile	logfile

-m, --mail send result via mail (mail_destinatarios)
 -h, --help print this help

5.2 configuration

The configuration of ip_update_gestioip.pl is stored in "ip_update_gestioip.conf".

Configuration parameter description:

<i>parameter</i>	<i>description</i>	<i>default value</i>
sid_ocs	SID of the OCS database	ocs
user_ocs	OCS database user	ocs
pass_ocs	OCS database user password	-
bbdd_host_ocs	Host where the OCS mysql database runs	-
sid_gestioip	SID of the GestióIP database	gestioip
user_gestioip	GestióIP database user	gestioip
pass_gestioip	GestióIP database user password	-
bbdd_host_gestioip	Host where the GestióIP mysql database runs	-
mail_destinatarios	Where to send the report. Coma separated list of mail addresses. Example: user1@domain.org,user2@domain.org	-
mail_from	“From” for the report mail. Change “your-domain” to your domain.	GestioIP@your-domain.org
logdir	Where to store the log file	/var/log
no_ping_redes	For networks which are not reachable with “ping”. Prevents that the automatic actualization adds the comment “does not respond to ping” to the host. Coma separated list. Example: 10.0.1.0,192.168.0.0	-
no_ocs_redes	For networks which should not be synchronized against the OCS. Coma separated list. Example: 10.0.1.0,192.168.0.0	-

5.3 automatic execution with cron

If you execute the script by cron you will need to configure the absolute path for the configuration file directly in script. Open the file `ip_update_gestioip.pl` with your favorite editor and change line 36 from

```
my $conf="./ip_update_gestioip.conf";
```

to

```
my $conf="/absolute/path/to/ip_update_gestioip.conf";
```

To execute the actualization of GestióIP automatically configure a cronjob.

Example: With the crontab entries below, the actualization against the OCS will be executed every day at 10:30, the actualization against the DNS (which works slower) every Sunday at 04:40 am.

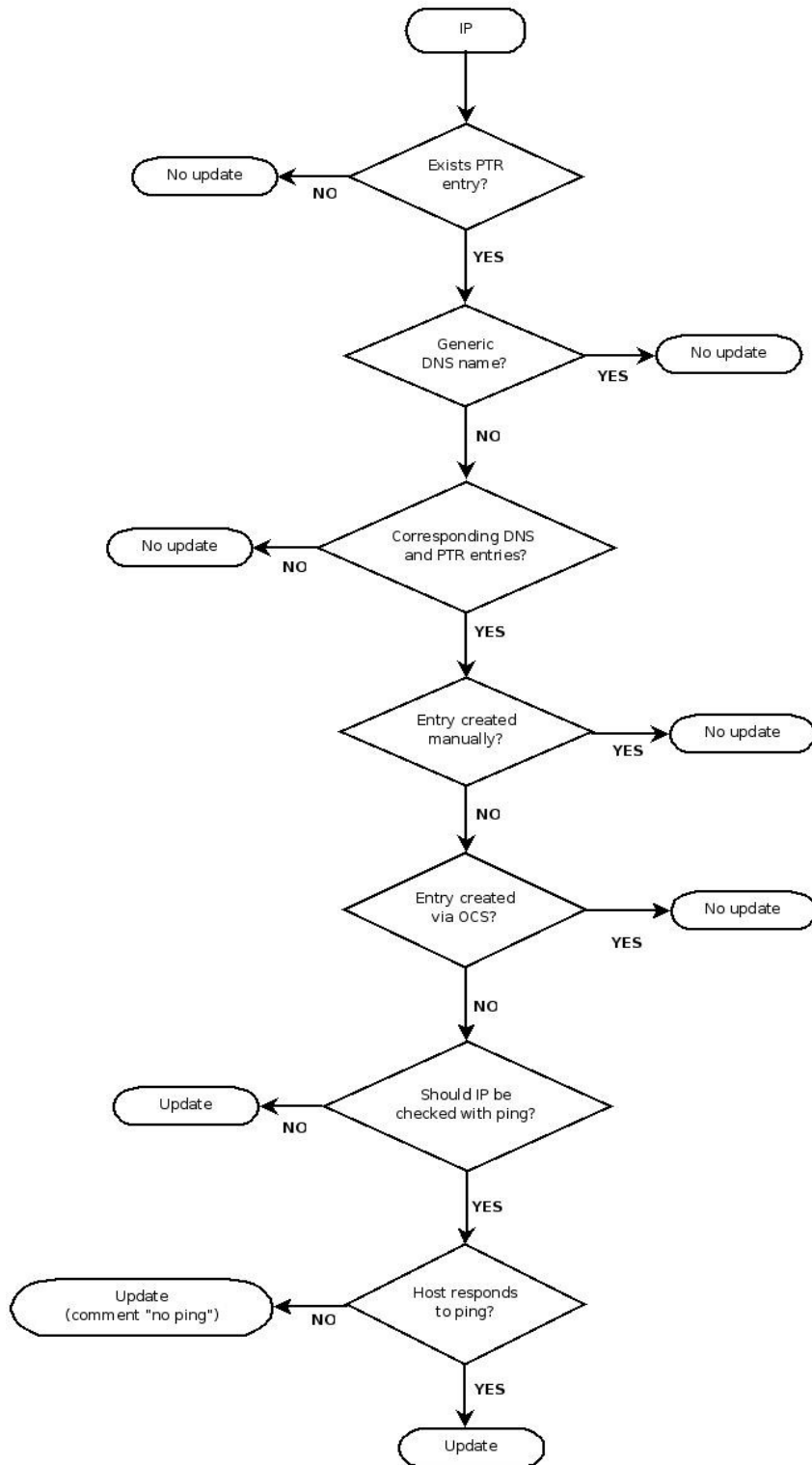
```
30 04 * * 0 /root/scripts/ip_update_gestioip.pl -d -m > /dev/null 2>&1
```

```
30 10 * * * /root/scripts/ip_update_gestioip.pl -o -m > /dev/null 2>&1
```

5.4 decision flow update entries

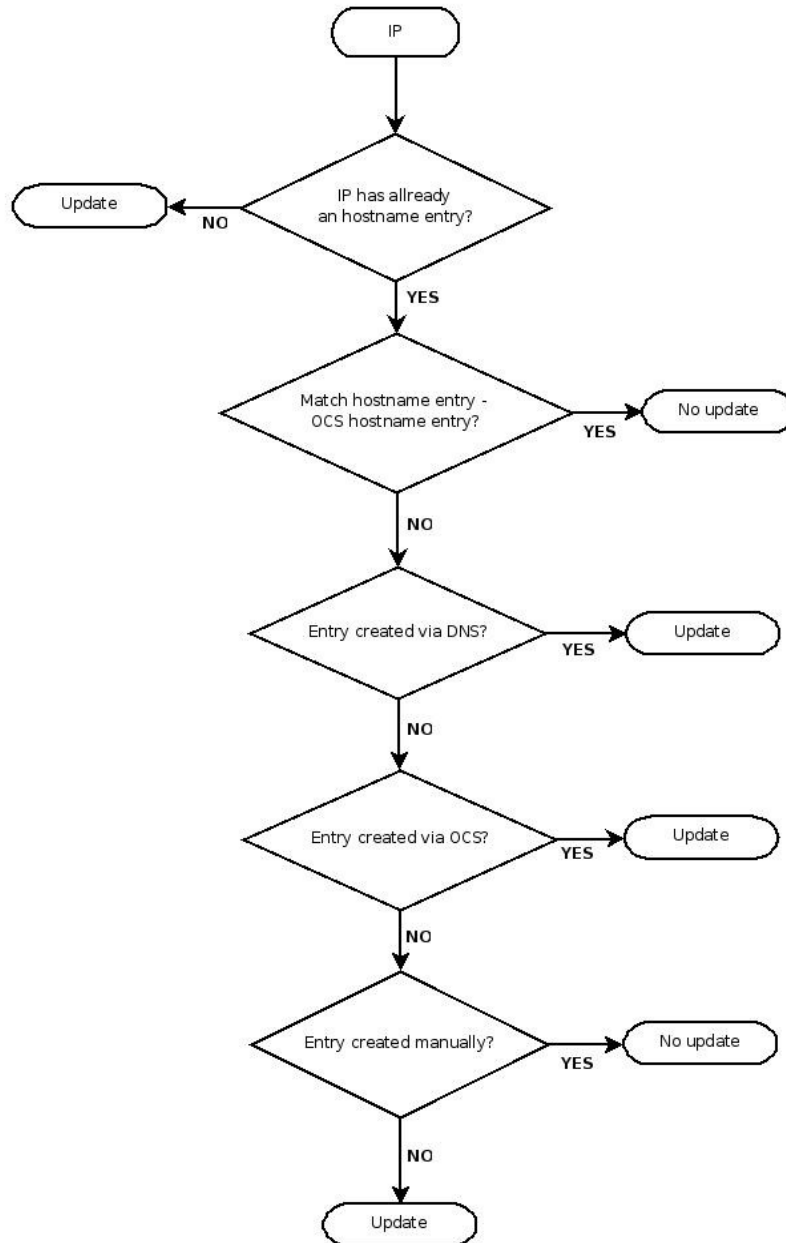
The decision on how an entry is updated follows the flow diagram below:

Automatic actualization against the DNS



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Automatic actualization against the OCS



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