



AUTOMATING NETWORK MAP CREATION

Pascal de JESSEY

Senior monitoring consultant, somone, france

pjessey@somone.fr

SOMONE in a nutshell



Consulting/Projects

- ✓ Audit, consulting
- ✓ Expertise on demand
- ✓ Migration, upgrade, turnkey projects, troubleshooting

Support

- ✓ Technical support and assistance services



Managed services

- ✓ Monitoring solution in managed mode
- ✓ Administration and operation of your monitoring system

Academy

- ✓ Certified or custom-made training

ZABBIX
CERTIFIED TRAINER

Whoami

- my name is Pascal de JESSEY
- zabbix user for many years **ZABBIX**
- Zabbix certified Trainer **ZABBIX**
CERTIFIED TRAINER
- linux and opensource user for nearly 30 years
- Loves to monitor the clouds ... from above



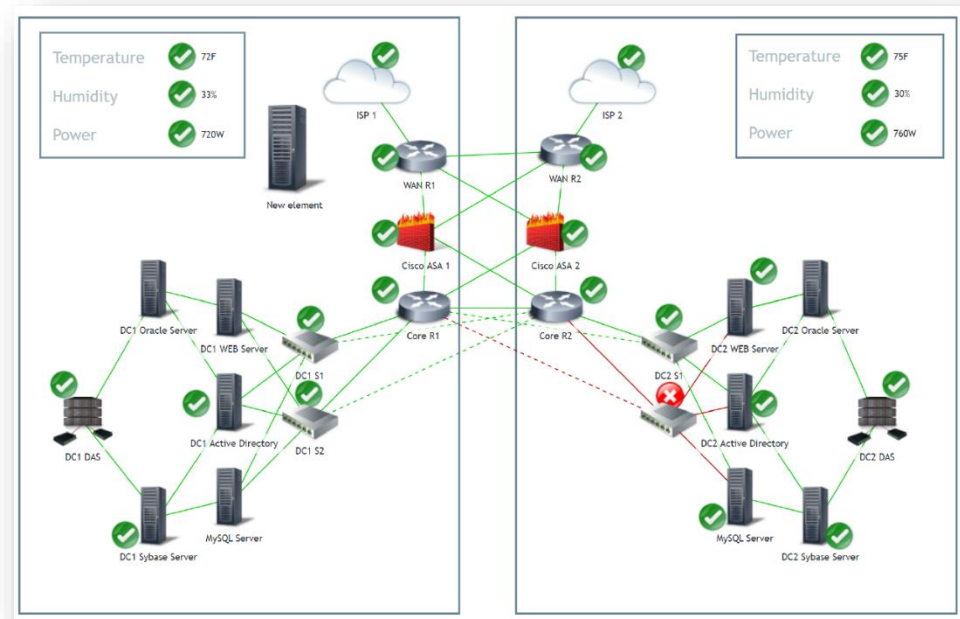
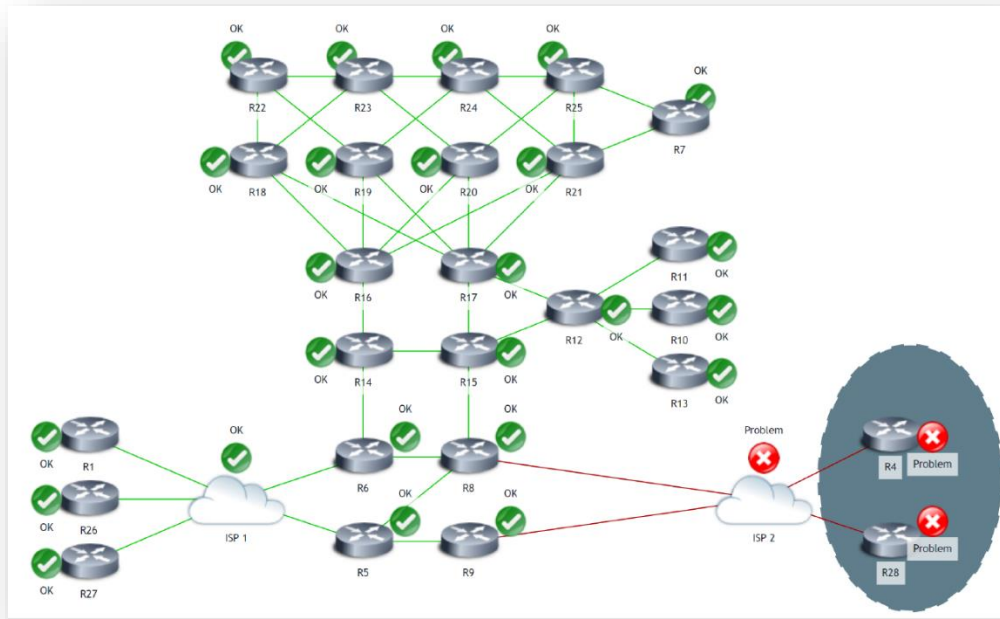
Agenda

- Maps are great !
- ... But
- What can we do ?
- What we'll use
- Principles
- The process
- Demo



Zabbix maps are great !

- Zabbix Maps can be really rich and very detailed
- icons, links, labels, etc.

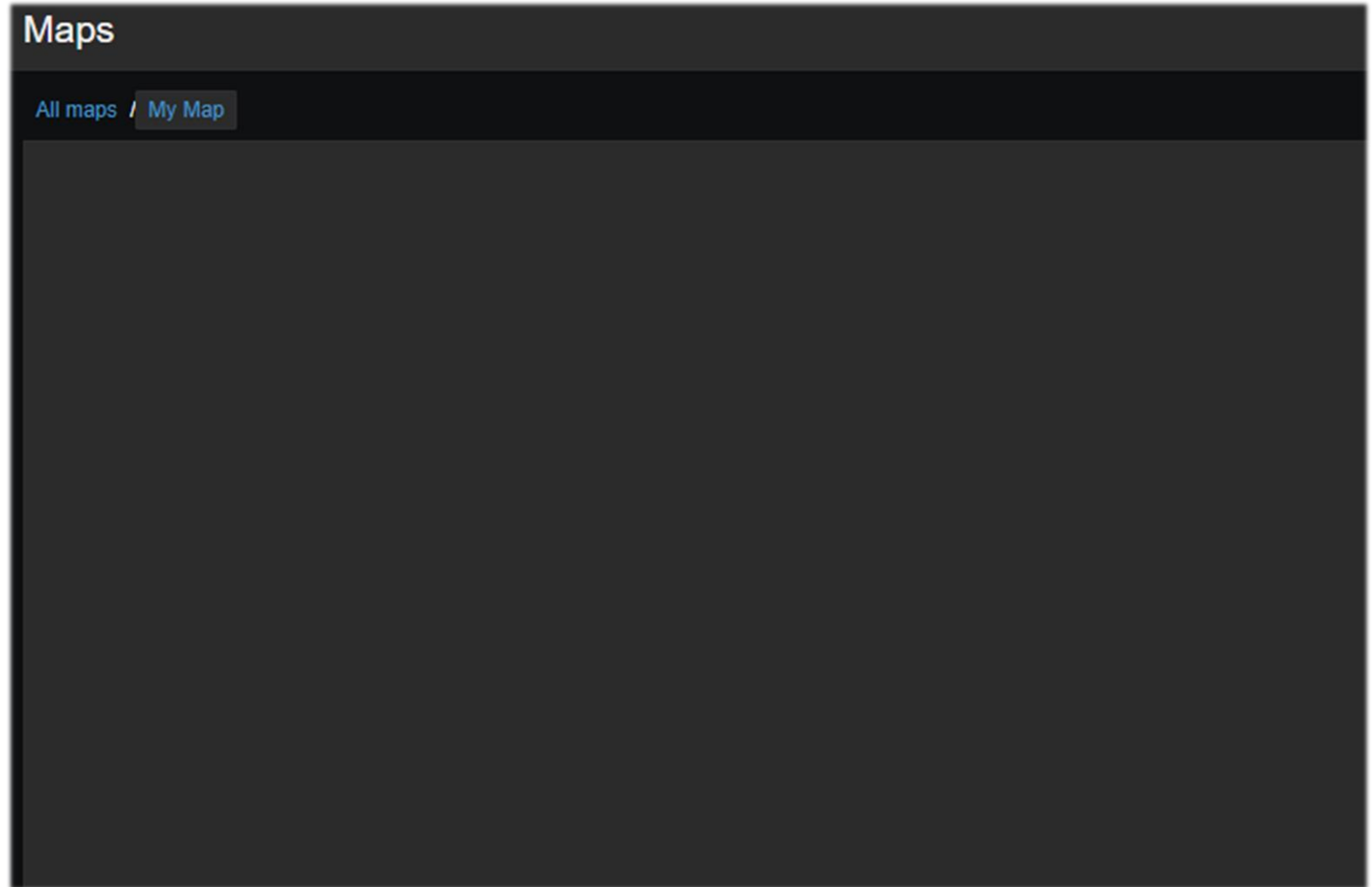


... But

- Design is manual
- Many steps needed
- Many information to configure
- Errors can happen anywhere



Typical map design process



Typical map design process



Map element: [Add / Remove](#) Shape: [Add / Remove](#) Link: [Add / Remove](#) Expand macros: [On](#) Grid: [Shown / On](#) 50x50 [Align map elements](#) [Update](#)

Y \ X:	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750
50															
100															
150															
200															
250															
300															
350															
400															
450															
500															
550															

Typical map design process



Map element: [Add / Remove](#) Shape: [Add / Remove](#) Link: [Add / Remove](#) Expand macros: [On](#) Grid: [Shown / On](#) 50x50 [Align map elements](#)

A screenshot of the Zabbix map design interface. The interface features a dark background with a light gray dashed grid. At the top, there is a toolbar with several interactive elements: 'Map element: Add / Remove', 'Shape: Add / Remove', 'Link: Add / Remove', 'Expand macros: On', 'Grid: Shown / On', a dropdown menu set to '50x50', and 'Align map elements'. On the left side of the grid, there is a server rack icon. Below the icon, the text 'New element' is displayed. The grid has numerical labels along the top (50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750) and along the left side (150, 200, 250, 300, 350).

Typical map design process



Map element: [Add / Remove](#) Shape: [Add / Remove](#) Link: [Add / Remove](#) Expand macros: [On](#) Grid: [Shown / On](#) 50x50 [Align map elements](#) [Update](#)

Y, X: 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750

50
100
150
200
250
300
350
400
450
500
550

New element

Map element ? X

Type

Label

Label location

Icons

Coordinates X Y

Name	URL	Action
<input type="text"/>	<input type="text"/>	Remove

[Add](#)

Typical map design process



Map element: [Add / Remove](#) Shape: [Add / Remove](#) Link: [Add / Remove](#) Expand macros: [On](#) Grid: [Shown / On](#) 50x50 [Align map elements](#) [Update](#)

Y: X: 50 100 150 200 250 300 350 400 450 500 550

Map element

Type: Host

Label: New element

Label location: Default

* Host: type here to search [Select](#)

Problem tags: [And/Or](#) [Or](#)

tag: Contains value [Remove](#)

[Add](#)

Automatic icon selection:

Icons: Default: Server_(96) Problem: Default Maintenance: Default Disabled: Default

Coordinates X: 189 Y: 227

URLs: Name URL Action [Remove](#)

[Add](#)

[Apply](#) [Remove](#) [Close](#)

Typical map design process



Map element: Add / Remove Shape: Add / Remove Link: Add / Remove Expand macros: On Grid: Shown / On 50x50 Align map elements Update

Y X: 50 100 150 200 250 300 350 400 450 500 550

50 100 150 200 250 300 350 400 450 500 550

New element

Map element

Type: Host

Label: {HOSTNAME} ({HOST.IP})

Label location: Default

Host: linux server

Problem tags: And/Or Or

Automatic icon selection:

Icons:

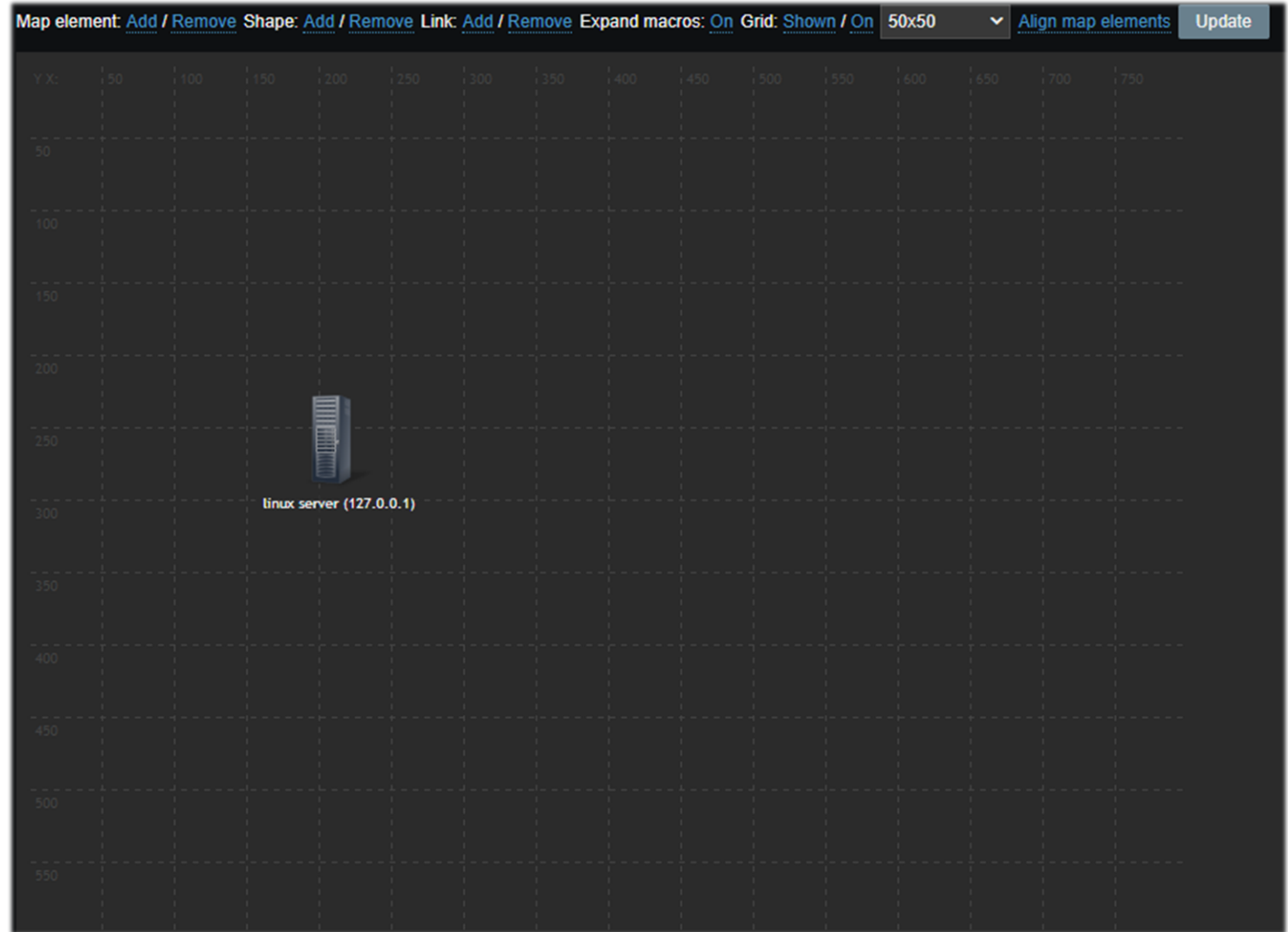
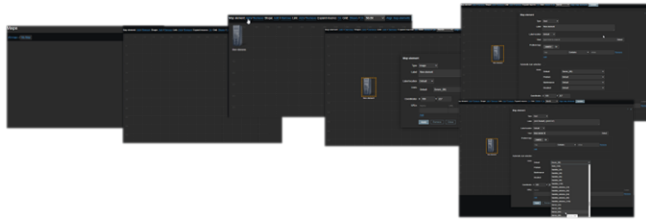
- Default: Server_96
- Problem: SAN_128
- Maintenance: Satellite_24
- Disabled: Satellite_64

Coordinates: X: 189 Y: 22

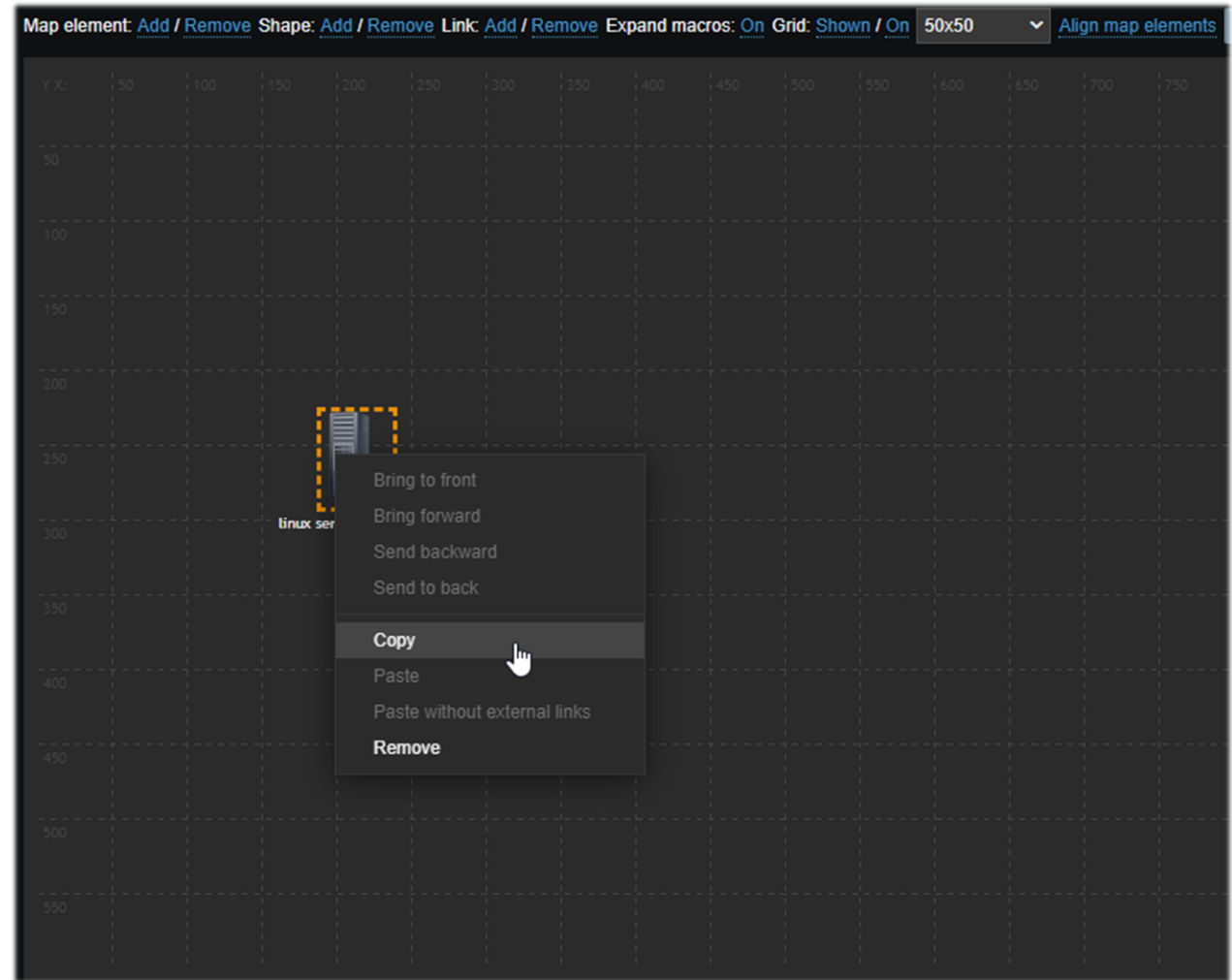
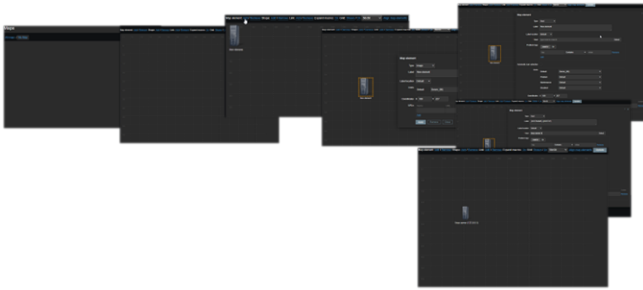
URLs:

Apply Remove

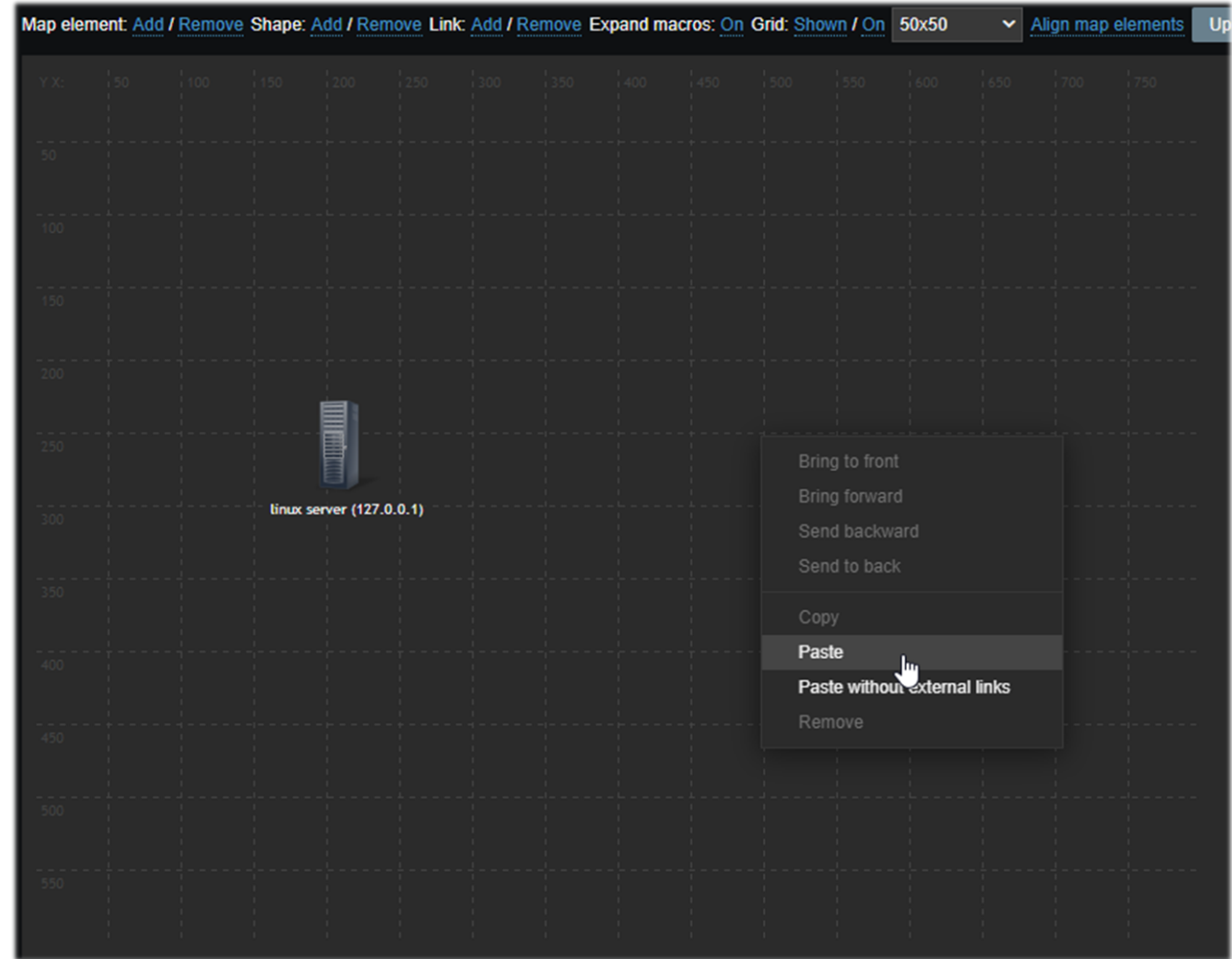
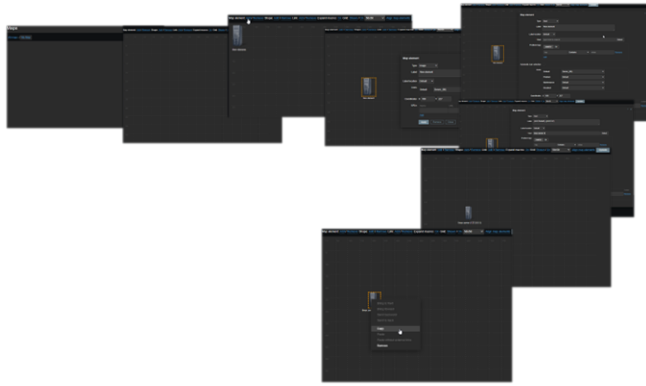
Typical map design process



Typical map design process



Typical map design process



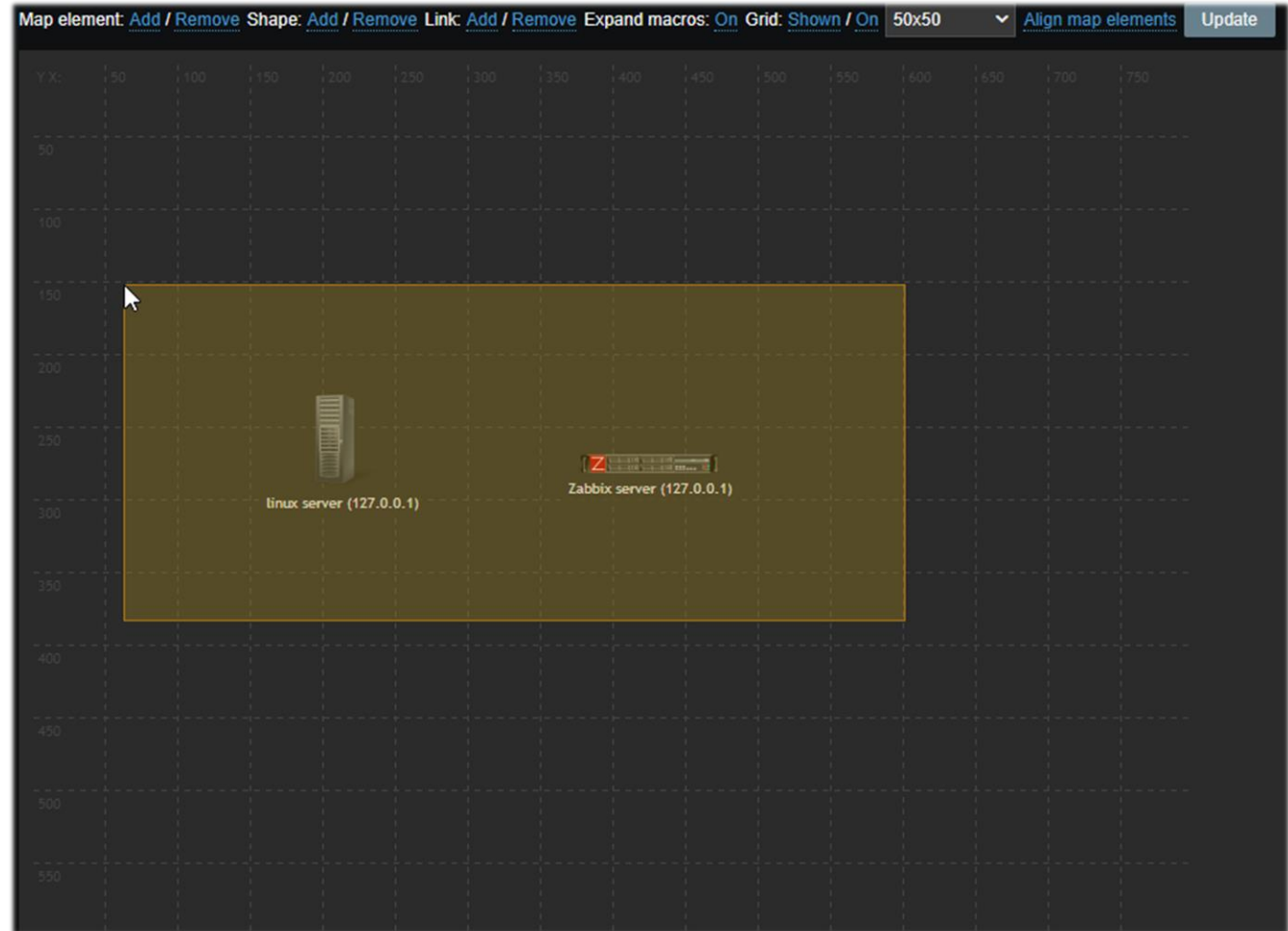
Typical map design process

A screenshot of the Zabbix map editor interface. The main map area shows a grid with two host elements: 'linux server (127.0.0.1)' and 'Zabbix server (127.0.0.1)'. The configuration panel on the right is titled 'Map element' and shows the following settings:

- Type: Host
- Label: {HOSTNAME} ({HOST.IP})
- Label location: Default
- * Host: Zabbix server X (with a 'Select' button)
- Problem tags: And/Or Or (with a 'tag' input, 'Contains' dropdown, 'value' input, and 'Remove' button)
- Automatic icon selection:
- Icons: Default Zabbix_server_2D_96 (with a dropdown arrow)
- Problem: Default (with a dropdown arrow)
- Maintenance: Default (with a dropdown arrow)
- Disabled: Default (with a dropdown arrow)
- Coordinates: X 501 Y 243
- URLs: Name URL (with input fields and a 'Remove' button)

Buttons at the bottom include 'Apply', 'Remove', and 'Close'.

Typical map design process



Typical map design process



Map element: [Add / Remove](#) Shape: [Add / Remove](#) Link: [Add / Remove](#) Expand macros: [On](#) Grid: [Shown / On](#) 50x50 [Align map elements](#) [Update](#)

Y X: 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750

75
100
150
200
250
300
350
400
450
500

linux server (127.0.0.1) Zabbix server (127.0.0.1)

Mass update elements

Selected elements

Type	Name
Host	linux server
Host	Zabbix server

Label

Label location Default

Automatic icon selection

Icon (default) Cloud_(24)

Icon (problem) Default

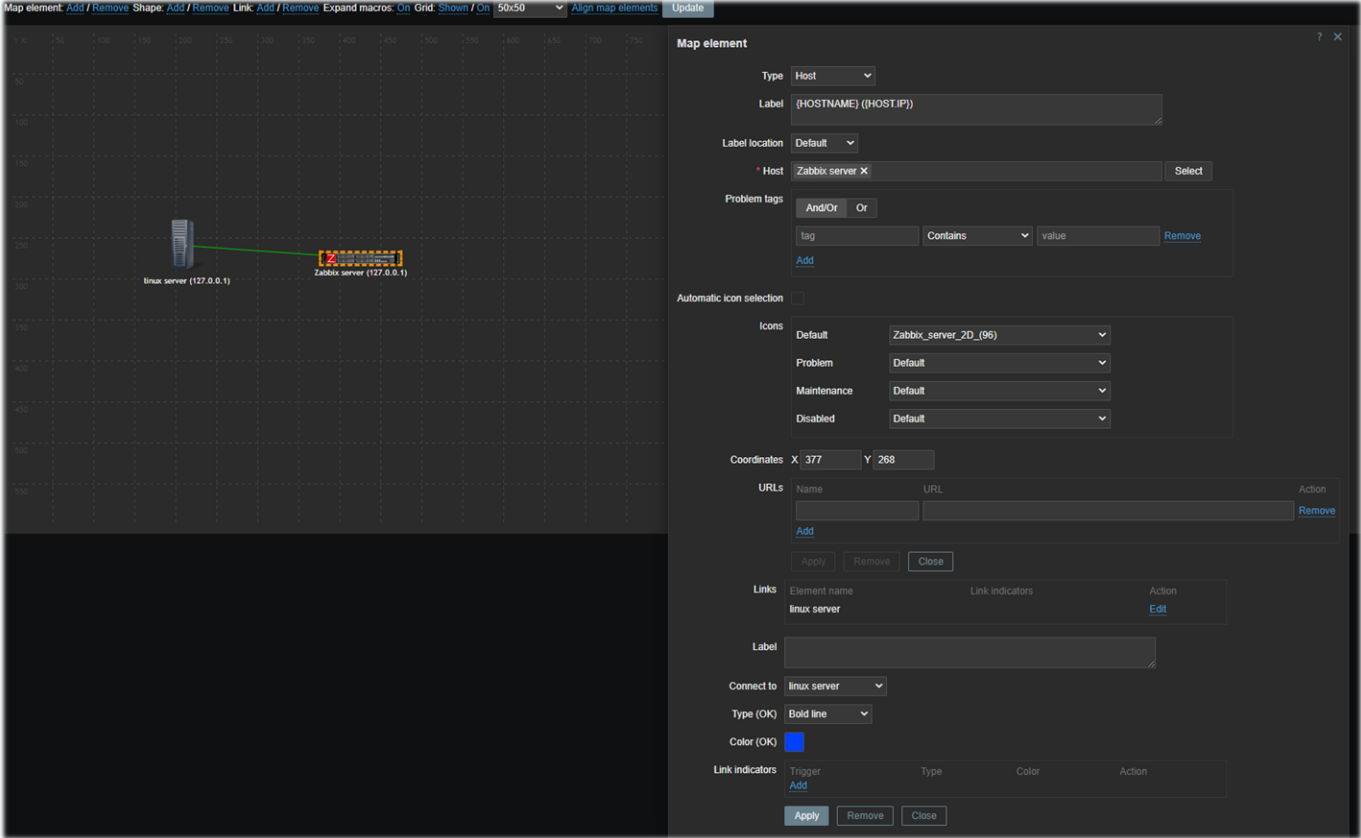
Icon (maintenance) Default

Icon (disabled) Default

[Apply](#) [Remove](#) [Close](#)

Links	From	To	Link indicators	Action
	linux server	Zabbix server		Edit

Typical map design process



Typical map design process



Network maps

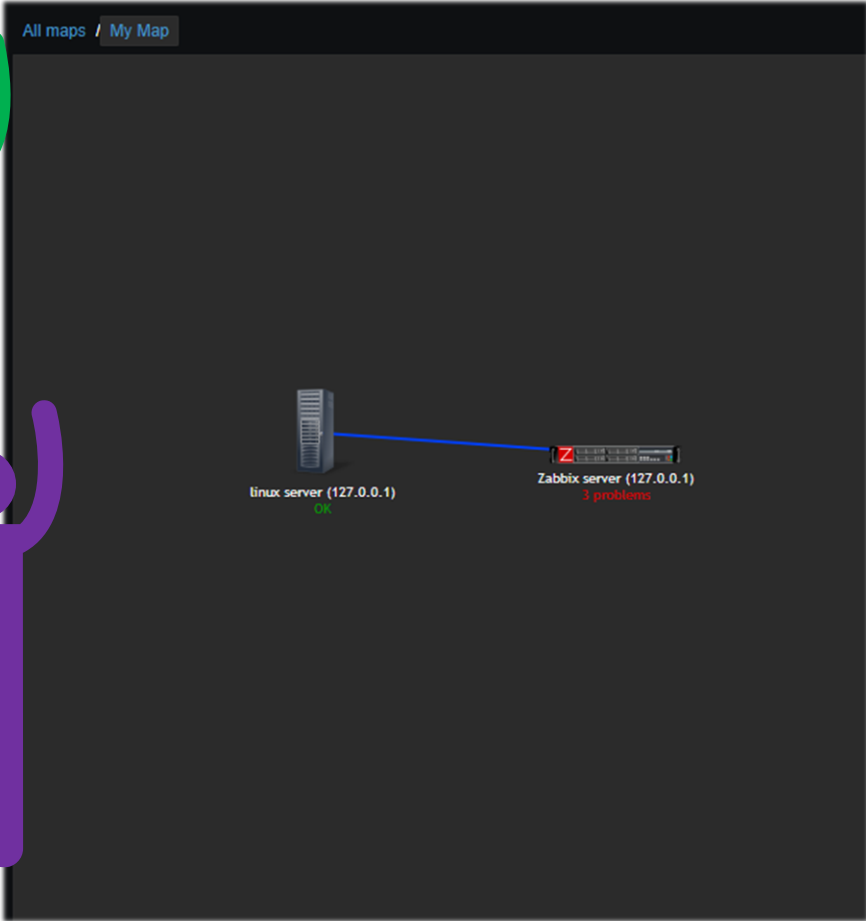
Map element: [Add / Remove](#) Shape: [Add / Remove](#) Link: [Add / Remove](#) Expand macros: [On](#) Grid: [Shown](#)

10.66.66.106 says
Map is updated! Return to map list?

OK Cancel

A screenshot of a network map interface. The map is displayed on a dark background with a light gray grid. The X-axis is labeled from 50 to 500 in increments of 50, and the Y-axis is labeled from 50 to 550 in increments of 50. Two server icons are connected by a blue line. The left server is labeled "linux server (127.0.0.1)" and the right server is labeled "Zabbix server (127.0.0.1)". A notification box in the top right corner contains the text "10.66.66.106 says" and "Map is updated! Return to map list?", with "OK" and "Cancel" buttons below it.

Typical map design process



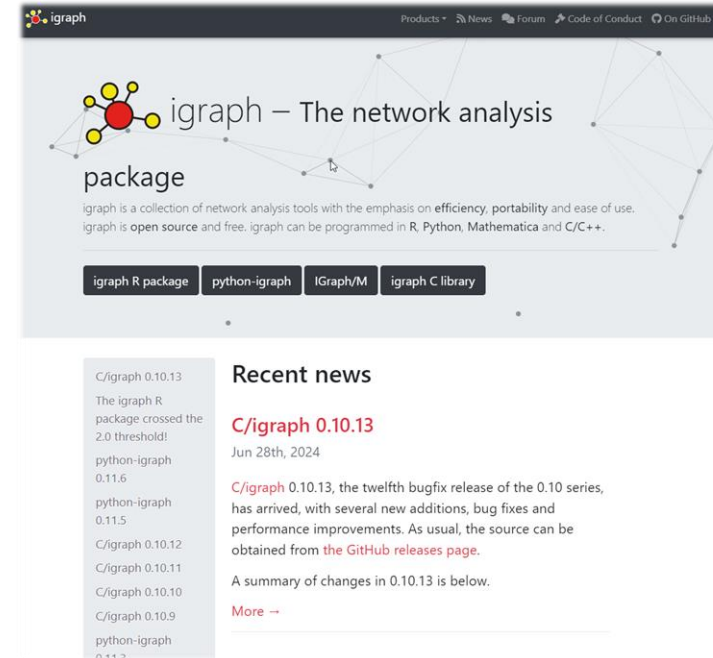
What can we do ?



What we'll use



zabbix_utils Python module



igraph Python module

Principles

- Simple
 - only a script to be launched, no dependencies
- Self-Contained
 - All the information is in zabbix
 - map size
 - host group
 - With specific tags, we can add more informations to the hosts :
 - link
 - label
 - type
 - ...

The process

map properties

Network maps

Map Sharing

Owner: Admin (Zabbix Administrator) X Select

Name: automap

Width: 1000

Height: 800

Background image: No image

Automatic icon mapping: <manual> show icon mappings

Icon highlight:

host group

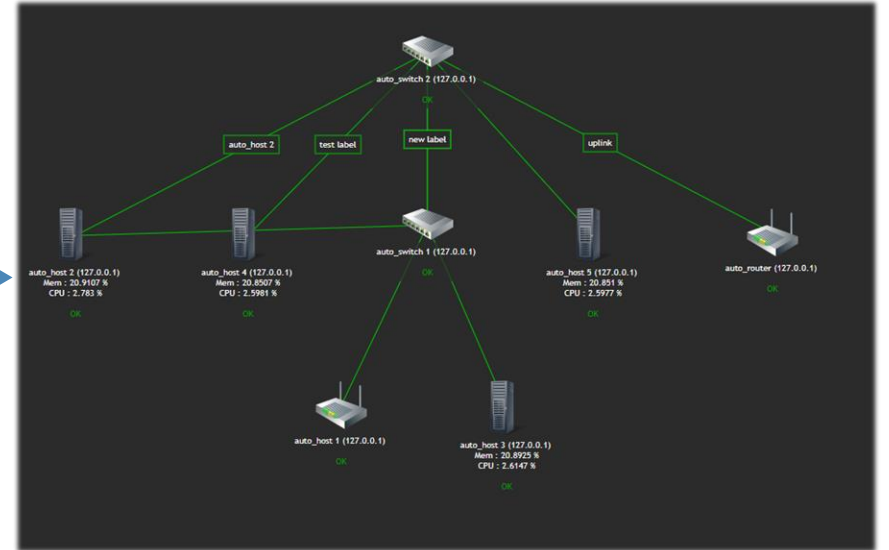
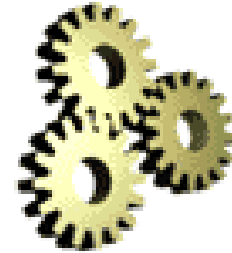
Name	Items	Triggers	Graphs	Discovery	Web interface	Proxy	Templates	Status	Availability	Agent encryption	Info	Tags
auto_host 1	Items 4	Triggers 34	Graphs 17	Discovery 3	Web 127.0.0.1:10050	Linux by Zabbix agent	Linux by Zabbix agent	Enabled	20%	None	am.host.type: router am.link.connect_to: au...	
auto_host 2	Items 4	Triggers 34	Graphs 17	Discovery 3	Web 127.0.0.1:10050	Linux by Zabbix agent	Linux by Zabbix agent	Enabled	20%	None	am.host.type: server am.link.connect_to: au...	
auto_host 3	Items 4	Triggers 34	Graphs 17	Discovery 3	Web 127.0.0.1:10050	Linux by Zabbix agent	Linux by Zabbix agent	Enabled	20%	None	am.host.type: server am.link.connect_to: au...	
auto_host 4	Items 4	Triggers 34	Graphs 17	Discovery 3	Web 127.0.0.1:10050	Linux by Zabbix agent	Linux by Zabbix agent	Enabled	20%	None	am.host.type: server am.link.connect_to: au...	
auto_host 5	Items 4	Triggers 34	Graphs 17	Discovery 3	Web 127.0.0.1:10050	Linux by Zabbix agent	Linux by Zabbix agent	Enabled	20%	None	am.host.type: server am.link.connect_to: au...	
auto_router	Items 32	Triggers 16	Graphs 2	Discovery 2	Web 127.0.0.1:161	Network Generic Device by SNMP	Network Generic Device by SNMP	Enabled	SNMP	None	am.host.type: router am.link.label: uplink	
auto_switch 1	Items 32	Triggers 16	Graphs 2	Discovery 2	Web 127.0.0.1:161	Network Generic Device by SNMP	Network Generic Device by SNMP	Enabled	SNMP	None	am.host.type: switch am.link.color: 0000ff am.link.connect_to: au...	
auto_switch 2	Items 32	Triggers 16	Graphs 2	Discovery 2	Web 127.0.0.1:161	Network Generic Device by SNMP	Network Generic Device by SNMP	Enabled	SNMP	None	am.host.type: switch am.link.label: auto_ho...	

host group

Host IPMI Tags 2 Macros Inventory Encryption Value mapping

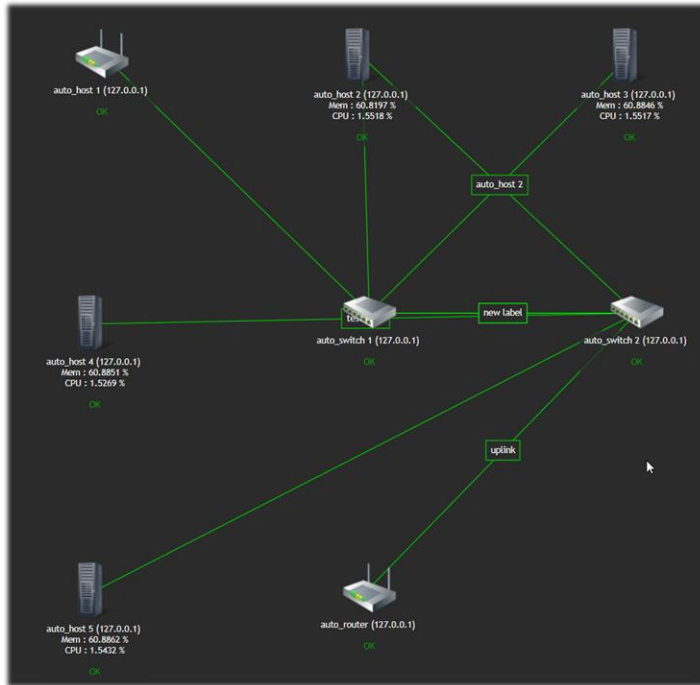
Tags	Name	Value
	am.host.type	router
	am.link.connect_to	auto_switch 1

[Add](#)

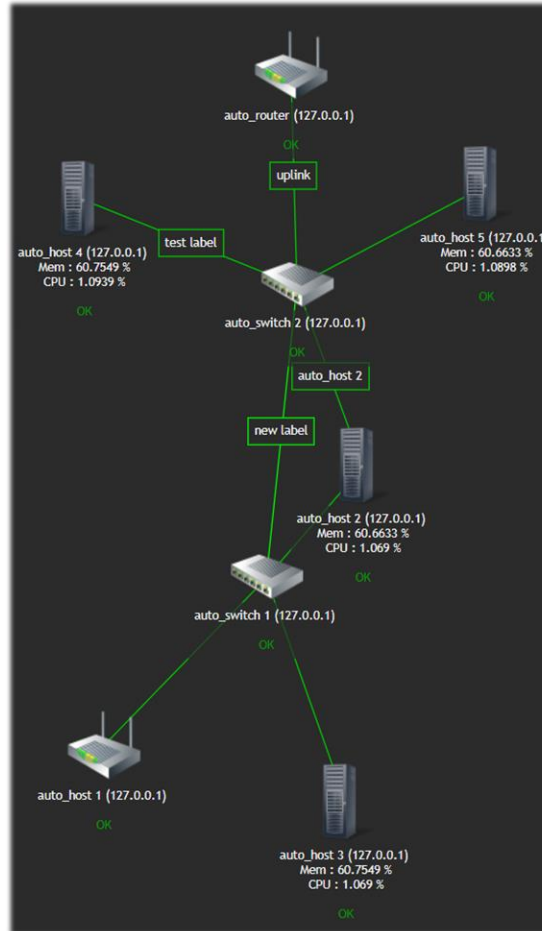


Generated map

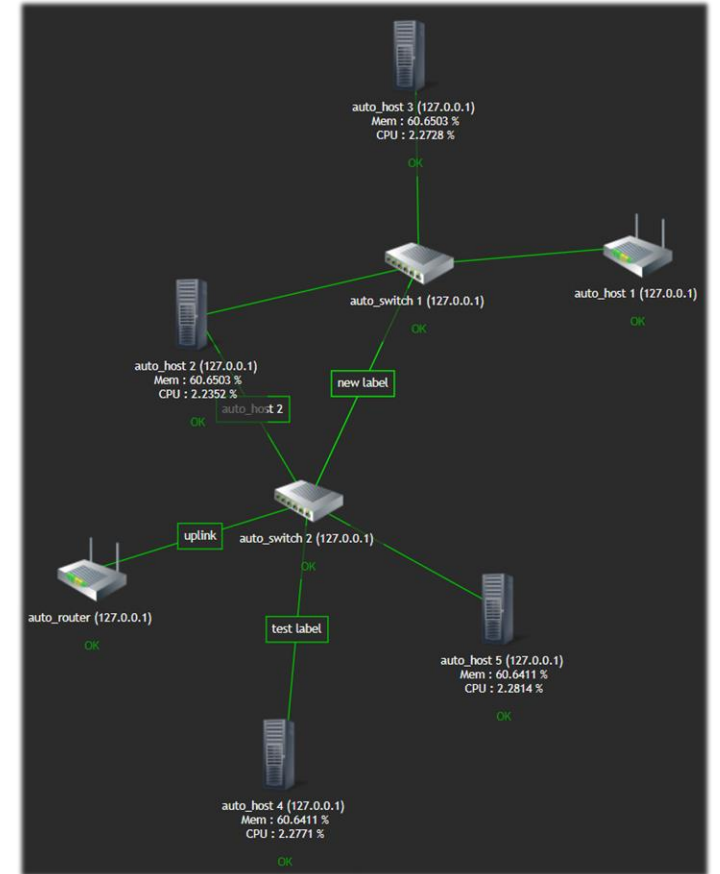
Layouts



Grid

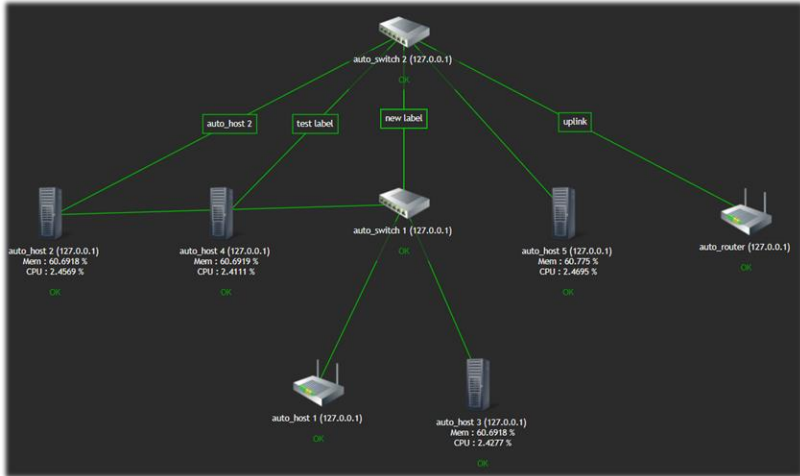


fruchterman
reingold

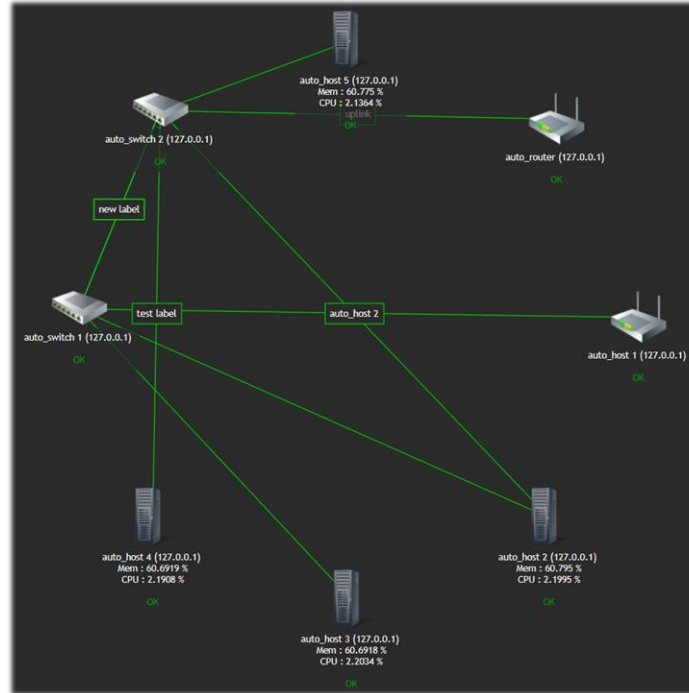


davidson
harel

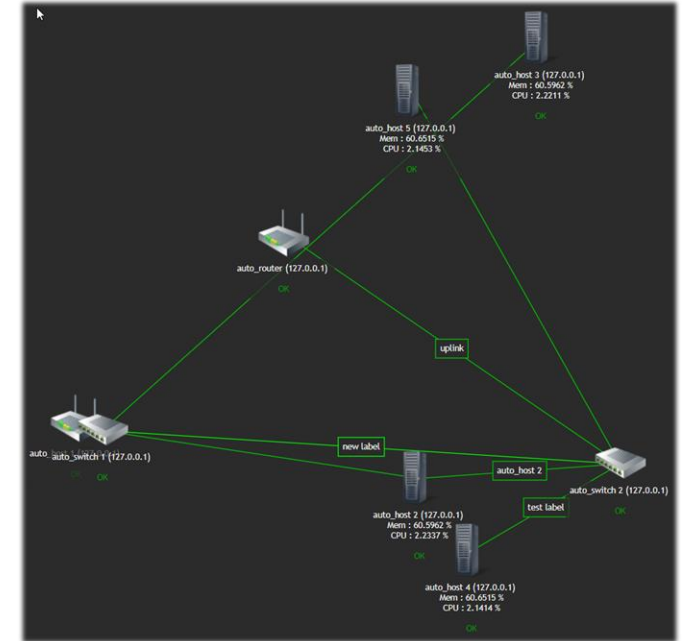
Layouts



tree



circle



random

Demo

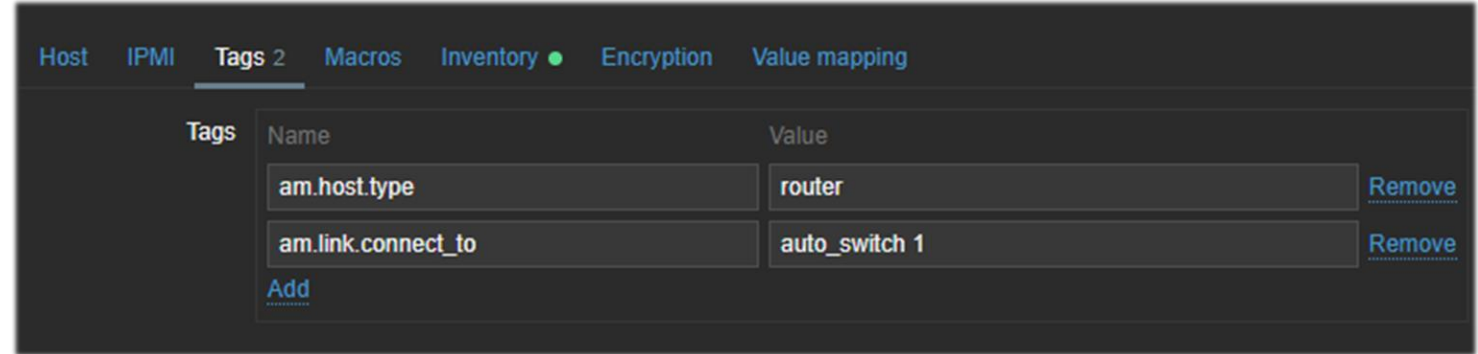


Improvements

- At the moment, the entire map is recreated whenever we launch the script. It would be great to be able to add/modify/delete some hosts on an existing map
- Ability to add submaps
- Add a frontend module to enable configuration directly from the frontend

Improvements

- We use host tags
 - Convenient, but not specifically designed for this purpose.



- Inventory fields ?
 - with custom fields this could be done ([ZBXNEXT-336](#))



Github Repository



<https://github.com/SomoneIT/zabbix-AutoMapper>

THANK YOU !