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# Deploy Zabbix in a consistent way

Zabbix Summit  
BeNeLux 2023

DEPARTEMENT  
OMGEVING

# Introduction: About Me

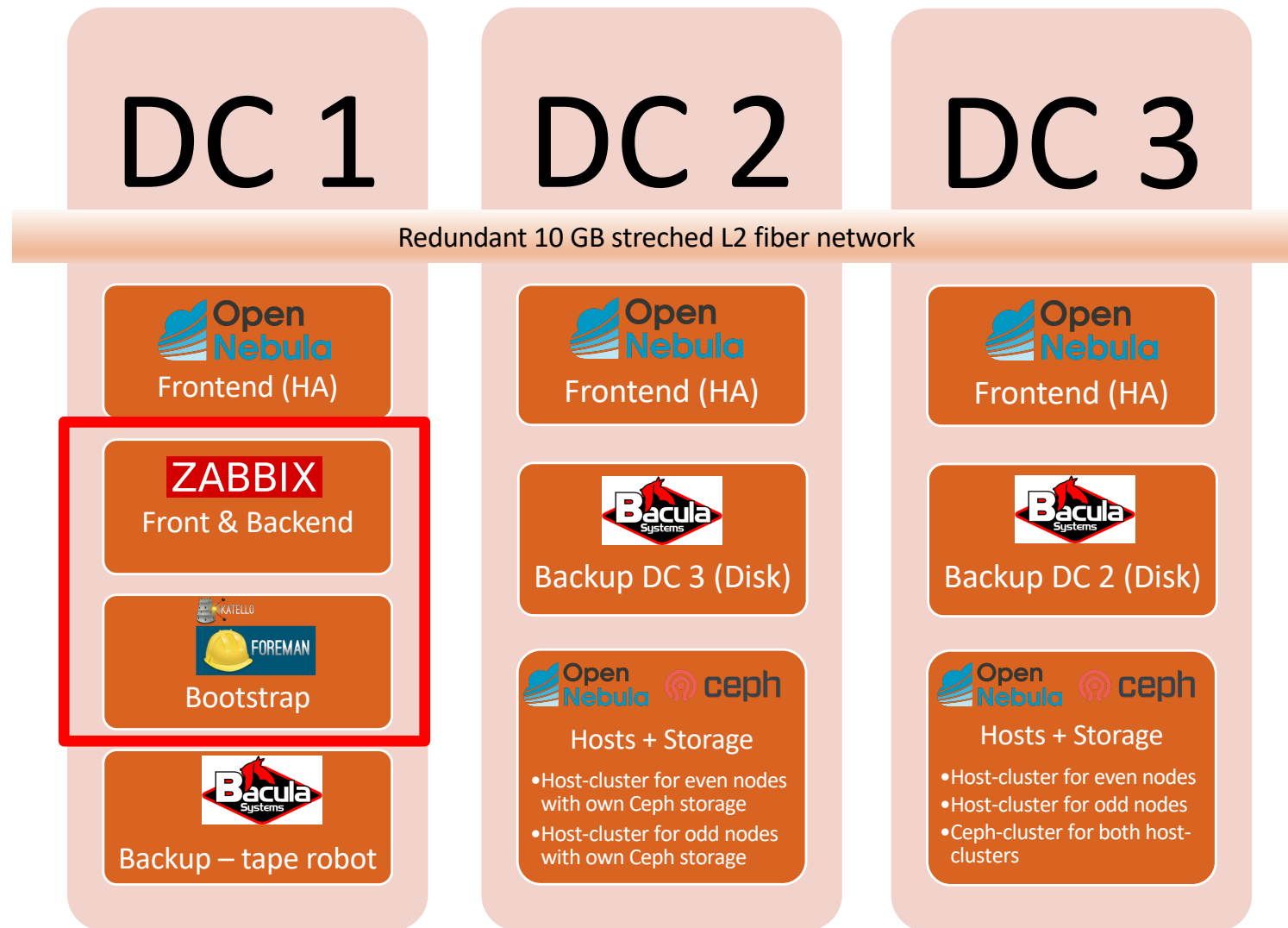
- ▶ **Geert Willems**
- ▶ **Flemish Government (2015)**  
→ Departement Omgeving/Environment
- ▶ **Infra-Team – System Engineer**
- ▶ **Aims to create integrated environmental/planning policy**

# Introduction: IT

- ▶ 5 Dev teams (50+ Devs) / 1 Infra/middleware team (7 FTE)
- ▶ 3 Datacenters
- ▶ Java/Spring boot or Open Source (300+)
- ▶ HA-setup
- ▶ Postgres Db's (170+)
- ▶ 3 environments (dev/test/prod)
- ▶ Hosting for other entities/agencies
- ▶ 500+ deploys/week

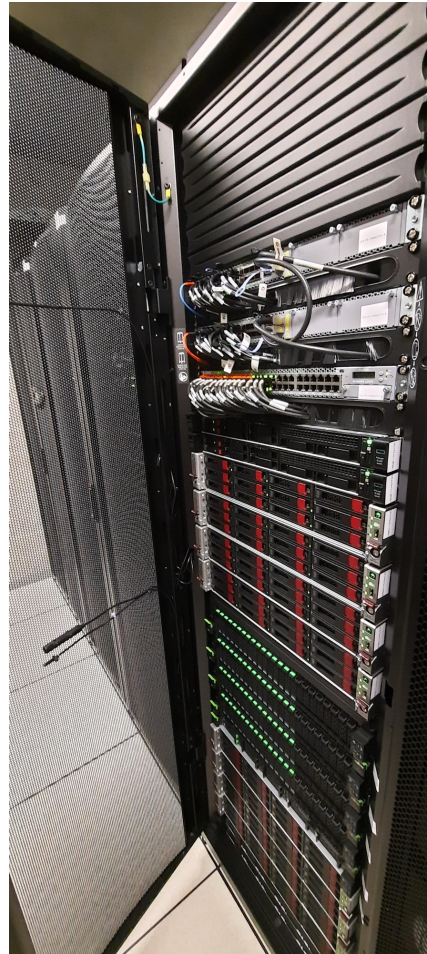
→ 2200+ Virtual Machines

# Infrastructure - Datacenters





# Infrastructure - Datacenters



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# Zabbix Server – Specs

## ► Fujitsu RX-2530 M5

- Intel(R) Xeon(R) Silver 4210R CPU @ 2.40GHz
  - × 20 cores
- 64 GB MEM
- 2 \* SSD -> RAID 1 -> OS
- NVMe -> Postgres DB
  - × backup with Barman -> Bacula
- Zabbix Backend
  
- KVM -> Zabbix Frontend + Vault

# Zabbix Server – Status

Status		
Parameter	Value	Details
Zabbix server is running	Yes	dc1-zabbix1.cumuli.be:10051
Number of hosts (enabled/disabled)	2383	2356 / 27
Number of templates	88	
Number of items (enabled/disabled/not supported)	420037	414323 / 5474 / 240
Number of triggers (enabled/disabled [problem/ok])	102078	97844 / 4234 [102 / 97742]
Number of users (online)	86	7
Required server performance, new values per second	1796.65	

# Provisioning bare-metal

- ▶ **Done by Bootstrap system -> Foreman/Katello/Pulp**
  - Create lifecycle environment
  - Configure OS / installation media / partition tables
  - Create/Configure products (Rocky/Zabbix/Postgres/...)
    - × repos (RPM/DEB/container)
  - Create content views
    - × Selection of repos
    - × Publish and promote it to the lifecycle environment
  - Create activation key
    - × Define list enable/disable repos to use on provisioned system
  - Create Host-group
    - × Selection of the above configurations
- ▶ **Install/upgrading systems with identical OS/products**



# Provisioning Zabbix – Products

- ▶ Rocky 8
  - ▶ Epel 8
  - ▶ Zabbix 6.0 (current 6.0.13)
  - ▶ Postgres 13.9
  - ▶ TimescaleDB 13.2.9
  - ▶ Hashicorp\_Vault 1.11.2
  - ▶ Bacula backup client
- 
- ▶ Required for host registration/config in Foreman
    - Puppet 6
    - Foreman Client

# Provisioning Zabbix – Products


FOREMAN DIDM <span>Any location</span> <span>Admin</span>						
Monitor	Type	Name	Product	Sync state	Content	Status
Content	<input type="checkbox"/>	AppStream x86_64 os	RockyLinux_8	✓ 21 days ago	7366 RPM packages 860 errata 59 package groups 125 module streams	✓ Added
Hosts	<input type="checkbox"/>	BaseOS x86_64 os	RockyLinux_8	✓ 21 days ago	1965 RPM packages 35 package groups	✓ Added
Configure	<input type="checkbox"/>	bin 12.8.1 rhel8-64	Bacula_12_8_1_EL8	✓ over 1 year ago	10 RPM packages	✓ Added
Infrastructure	<input type="checkbox"/>	Epel_el8	Epel_EL8	✓ 21 days ago	15023 RPM packages 4832 errata 22 package groups	✓ Added
Administer	<input type="checkbox"/>	extras x86_64 os	RockyLinux_8	✓ 21 days ago	48 RPM packages	✓ Added
	<input type="checkbox"/>	Foreman_Client_el8	Foreman_Client_EL8	✓ over 1 year ago	15 RPM packages 1 package group	✓ Added
	<input type="checkbox"/>	Hashicorp_Vault_x86_64	Hashicorp_Vault	Not synced	3 RPM packages	✓ Added
	<input type="checkbox"/>	Postgres_13_el8	Postgres_13_EL8	✓ about 2 months ago	877 RPM packages 1 package group	✓ Added
	<input type="checkbox"/>	PowerTools x86_64 os	RockyLinux_8	✓ 21 days ago	2406 RPM packages 277 errata 1 package group 8 module streams	✓ Added
	<input type="checkbox"/>	Puppet_6_el8_x86_64	Puppet_6_EL8	✓ about 1 year ago	277 RPM packages	✓ Added
	<input type="checkbox"/>	TimeScaleDB_el8	TimeScaleDB_EL8	✓ about 2 months ago	335 RPM packages	✓ Added
	<input type="checkbox"/>	x86_64	Zabbix_6_0_EL8	✓ about 1 month ago	303 RPM packages	✓ Added



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# Provisioning Zabbix – Activation Key

☰


 FOREMAN


DIDM

▼

 Any location

▼



 Admin User ▼

Monitor >

Content >

Hosts >

Configure >

Infrastructure >

Administer >

Key\_Zabbix\_Server

Select Action ▼

Activation Keys > Key\_Zabbix\_Server > Repository Sets

Details Subscriptions Repository Sets Host Collections Associations ▼

ⓘ Below are the Repository Sets currently available for this activation key through its subscriptions. For Red Hat subscriptions, additional content can be made available through the [Red Hat Repositories](#) page. Changing default settings for content hosts that register with this activation key requires subscription-manager version 1.10 or newer to be installed on that host.

Filter... Search ▼ ☐ Show All ☐ Limit to Environment Select Action ▼

0 of 14 Selected

<input type="checkbox"/>	Repository Name	Product Name	Repository Path	Status
<input type="checkbox"/>	AppStream x86_64 os	<a href="#">RockyLinux_8</a>	/custom/RockyLinux_8/AppStream_x86_64_os	Enabled
<input type="checkbox"/>	BaseOS x86_64 os	<a href="#">RockyLinux_8</a>	/custom/RockyLinux_8/BaseOS_x86_64_os	Enabled
<input type="checkbox"/>	bin 12.8.1 rhel8-64	<a href="#">Bacula_12_8_1_EL8</a>	/custom/Bacula_12_8_1_EL8/bin_12_8_1_rhel8-64	Enabled
<input type="checkbox"/>	bweb 12.8.1 rhel8-64	<a href="#">Bacula_12_8_1_EL8</a>	/custom/Bacula_12_8_1_EL8/bweb_12_8_1_rhel8-64	Disabled (overridden)
<input type="checkbox"/>	dedup 12.8.1 rhel8-64	<a href="#">Bacula_12_8_1_EL8</a>	/custom/Bacula_12_8_1_EL8/dedup_12_8_1_rhel8-64	Disabled (overridden)
<input type="checkbox"/>	EpeL_el8	<a href="#">EpeL_EL8</a>	/custom/EpeL_EL8/EpeL_el8	Disabled (overridden)
<input type="checkbox"/>	extras x86_64 os	<a href="#">RockyLinux_8</a>	/custom/RockyLinux_8/extras_x86_64_os	Enabled
<input type="checkbox"/>	Foreman_Client_el8	<a href="#">Foreman_Client_EL8</a>	/custom/Foreman_Client_EL8/Foreman_Client_el8	Enabled
<input type="checkbox"/>	Hashicorp_Vault_x86_64	<a href="#">Hashicorp_Vault</a>	/custom/Hashicorp_Vault/Hashicorp_Vault_x86_64	Enabled
<input type="checkbox"/>	Postgres_13_el8	<a href="#">Postgres_13_EL8</a>	/custom/Postgres_13_EL8/Postgres_13_el8	Enabled
<input type="checkbox"/>	PowerTools x86_64 os	<a href="#">RockyLinux_8</a>	/custom/RockyLinux_8/PowerTools_x86_64_os	Enabled
<input type="checkbox"/>	Puppet_6_el8_x86_64	<a href="#">Puppet_6_EL8</a>	/custom/Puppet_6_EL8/Puppet_6_el8_x86_64	Enabled
<input type="checkbox"/>	TimeScaleDB_el8	<a href="#">TimeScaleDB_EL8</a>	/custom/TimeScaleDB_EL8/TimeScaleDB_el8	Enabled
<input type="checkbox"/>	x86_64	<a href="#">Zabbix_6_0_EL8</a>	/custom/Zabbix_6_0_EL8/x86_64	Enabled

25 per page Showing 1 - 14 of 14 1 of 1



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# Provision/install Zabbix backend

## ▶ Bootstrap-system

- Clean server installation over PXE
- Upgrade OS and products

## ▶ Zabbix install/config

- Ansible
  - × Custom playbook/roles
    - Install/config zabbix
    - Install/config Postgres
      - ▶ Tuning
      - ▶ TimeScaleDB plugin
    - Install/config Barman and Bacula backup

# Provisioning Zabbix Frontend

- ▶ **Runs in a KVM**
  - config in Foreman



Compute profile \*

dc1-zabbix1-frontend ▼

Compute resource \*

dc1-zabbix1 (Libvirt) ▼

CPUs

4 ▼

CPU mode

default ▼

Memory

4096 MB ▼

Image

▼

Image to use

### Network interfaces

Network type

Physical (Bridge) ▼

✖

Network

br-pxe ▼

NIC type

virtio ▼

Network type

Physical (Bridge) ▼

✖

Network

br-980 ▼

NIC type

virtio ▼

+ Add Interface

### Storage

Storage pool

images ▼

✖

Size (GB)

15G

Allocation (GB)

15G

None

Size

Full

Type

RAW ▼



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# Provisioning Zabbix Frontend

- ▶ **Runs in a VM**
  - config in Foreman
- ▶ **Vault installed**
  - Retrieve passwords secure
  - Avoid passwords stored in the database on the backend
- ▶ **Installation of frontend and vault**
  - Custom ansible playbook/roles

# Update OS and Products

☰

FOREMAN

DIDM

Any location

🔔

Admin User

Monitor

Content

Hosts

Configure

Infrastructure

Administer

## Content Hosts

zabbix

Search

Export

Register Content Host

Select Action

0 of 3 Selected

<input type="checkbox"/>	Name	Subscription Status	Installable Updates	OS	Lifecycle Environment	Content View	Registered	Last Checkin
<input type="checkbox"/>	<a href="#">dcl-zabbix1.cumuli.be</a>	✔	0  0  0	Rocky Linux 8.7	Zabbix-Server	Zabbix_Server	February 21, 2023 at 03:11 PM	April 04, 2023 at 08:03 PM
<input type="checkbox"/>	<a href="#">dcl-zabbix1-frontend.cumuli.be</a>	✔	0  0  0	Rocky Linux 8.7	Zabbix-Server	Zabbix_Server	March 30, 2022 at 11:15 AM	April 04, 2023 at 08:24 PM
<input type="checkbox"/>	<a href="#">dcl-zabbix-reporting.cumuli.be</a>	✔	0  0  0	Rocky Linux release 8.5 (Green Obsidian)	Zabbix_Server_Reporting	Zabbix_Server_Reporting	March 29, 2022 at 11:29 AM	April 04, 2023 at 08:23 PM

25 per page

Showing 1 - 3 of 3

1 of 1

# Update OS and Products

dcl-a-f-one- fe1.cumuli.be	✓	0  0  0 2	Ubuntu 22.04 LTS
-------------------------------	---	--------------	------------------

Details Provisioning Details Subscriptions Host Collections Tasks Deb Packages ▼ Errata Module Streams Traces Repository Sets

Applicable Deb Packages

Filter... Search ▼ Upgrade Selected ▼ Update All Deb Packages

0 of 2 Selected

<input type="checkbox"/> Upgradable Package	Version	Architecture
<input type="checkbox"/> sosreport	4.4-lubuntu1.22.04.1	amd64
<input type="checkbox"/> sudo	1.9.9-lubuntu2.1	amd64

25 ▼ per page Showing 1 - 2 of 2 << < 1 of 1 > >>

<input type="checkbox"/> Type	Id	Title	Issued
<input type="checkbox"/> Security Advisory - Important	<a href="#">RLSA-2022-5095</a>	Important: grub2, mokutil, shim, and shim-unsigned-x64 security update	02/02/2023
<input type="checkbox"/> Security Advisory - Low	<a href="#">RLSA-2022-2031</a>	Low: libssh security, bug fix, and enhancement update	02/02/2023
<input type="checkbox"/> Security Advisory - Important	<a href="#">RLSA-2022-5564</a>	Important: kernel security, bug fix, and enhancement update	07/13/2022
<input type="checkbox"/> Security Advisory - Moderate	<a href="#">RLSA-2022-5313</a>	Moderate: curl security update	06/28/2022

# Provisioning Zabbix proxies

- ▶ **11 proxies – VMs**
  - Different environments
  - Mix of active and passive
- ▶ **Deployed in OpenNebula Cloud infrastructure**
  - Deployment done by inhouse deploy-tool
  - Server config -> Yaml template file
    - × OS image/size
    - × Nmbr of CPUs
    - × MEM size
    - × ...
  - Ansible role for install/config of Zabbix
  - See talk Riga Oct 2022



# Hosts

Create host Import

Filter

Host groups type here to search Select

Templates type here to search Select

Name zabbixproxy

DNS

IP

Port

Monitored by Any Server Proxy

Proxy Select

Tags And/Or Or

tag Contains value Remove

Add

Apply

Reset

<input type="checkbox"/>	Name	Items	Triggers	Graphs	Discovery	Web	Interface	Proxy	Templates	Status	Availability	Agent encryption	Info	Tags
<input type="checkbox"/>	vioe-zabbixproxy-prod-1.vm.cumuli.be	Items 138	Triggers 51	Graphs 17	Discovery 4	Web	10.40.15.5:10050	vioe-zabbixproxy-prod-1	Template AGENT OS Linux, Template AGENT Zabbix Proxy	Enabled	ZBX	None		
<input type="checkbox"/>	vioe-zabbixproxy-test-1.vm.cumuli.be	Items 138	Triggers 51	Graphs 17	Discovery 4	Web	10.42.15.5:10050	vioe-zabbixproxy-test-1	Template AGENT OS Linux, Template AGENT Zabbix Proxy	Enabled	ZBX	None		
<input type="checkbox"/>	zabbixproxy-build-2.vm.cumuli.be	Items 140	Triggers 54	Graphs 17	Discovery 4	Web	10.48.0.51:10050	zabbixproxy-build-2	Template AGENT OS Linux, Template AGENT Zabbix Proxy	Enabled	ZBX	None		
<input type="checkbox"/>	zabbixproxy-dmz-2.vm.cumuli.be	Items 140	Triggers 54	Graphs 17	Discovery 4	Web	10.44.16.61:10050	zabbixproxy-dmz-2	Template AGENT OS Linux, Template AGENT Zabbix Proxy	Enabled	ZBX	None		
<input type="checkbox"/>	zabbixproxy-oe-1.vm.cumuli.be	Items 140	Triggers 54	Graphs 17	Discovery 4	Web	10.32.15.60:10050	zabbixproxy-oe-1	Template AGENT OS Linux, Template AGENT Zabbix Proxy	Enabled	ZBX	None		
<input type="checkbox"/>	zabbixproxy-oe-2.vm.cumuli.be	Items 140	Triggers 54	Graphs 17	Discovery 4	Web	10.32.15.62:10050	zabbixproxy-oe-2	Template AGENT OS Linux, Template AGENT Zabbix Proxy	Enabled	ZBX	None		
<input type="checkbox"/>	zabbixproxy-on-1.vm.cumuli.be	Items 140	Triggers 54	Graphs 17	Discovery 4	Web	10.30.15.60:10050	zabbixproxy-on-1	Template AGENT OS Linux, Template AGENT Zabbix Proxy	Enabled	ZBX	None		
<input type="checkbox"/>	zabbixproxy-on-2.vm.cumuli.be	Items 140	Triggers 54	Graphs 17	Discovery 4	Web	10.30.15.61:10050	zabbixproxy-on-2	Template AGENT OS Linux, Template AGENT Zabbix Proxy	Enabled	ZBX	PSK None PSK CERT		
<input type="checkbox"/>	zabbixproxy-pr-1.vm.cumuli.be	Items 140	Triggers 54	Graphs 17	Discovery 4	Web	10.34.15.60:10050	zabbixproxy-pr-1	Template AGENT OS Linux, Template AGENT Zabbix Proxy	Enabled	ZBX	None		
<input type="checkbox"/>	zabbixproxy-pr-2.vm.cumuli.be	Items 140	Triggers 54	Graphs 17	Discovery 4	Web	10.34.15.61:10050	zabbixproxy-pr-2	Template AGENT OS Linux, Template AGENT Zabbix Proxy	Enabled	ZBX	None		
<input type="checkbox"/>	zabbixproxy-untrust-2.vm.cumuli.be	Items 140	Triggers 54	Graphs 17	Discovery 4	Web	10.38.15.61:10050	zabbixproxy-untrust-2	Template AGENT OS Linux, Template AGENT Zabbix Proxy	Enabled	ZBX	None		

Displaying 11 of 11 found



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# Proxies

[Create proxy](#)

Filter

Name
Mode

Any
Active
Passive

Apply
Reset

<input type="checkbox"/>	Name ▲	Mode	Encryption	Compression	Last seen (age)	Host count	Item count	Required performance (vps)	Hosts
<input type="checkbox"/>	zabbixproxy-on-1	Active	PSK	On	5s	148	32607	101.42	acdrupal-postgres-on-1.vm.cumuli.be, archiefalgemeen-postgres-on-1.vm.cumuli.be, archiefdsi-postgres-on-1.vm.cumuli.be, archiefimjv-postgres-on-1.vm.cumuli.be, archiefomv-postgres-on-1.vm.cumuli.be, bed-postgres-on-1.vm.cumuli.be, bredero-postgres-on-1.vm.cumuli.be, brederoacc1-postgres-on-1.vm.cumuli.be, brederoacc2-postgres-on-1.vm.cumuli.be, bsos-postgres-on-1.vm.cumuli.be, cbb-postgres-on-1.vm.cumuli.be, certificateprovisioning-postgres-on-1.vm.cumuli.be, confluence-postgres-on-1.vm.cumuli.be, copres-postgres-on-1.vm.cumuli.be, crucible-postgres-on-1.vm.cumuli.be, dali-postgres-on-1.vm.cumuli.be, dataingest-postgres-on-1.vm.cumuli.be, datamanager-postgres-on-1.vm.cumuli.be, datasets-postgres-on-1.vm.cumuli.be, datawarehouse-postgres-on-1.vm.cumuli.be, dierenwelzijn-postgres-on-1.vm.cumuli.be, dms-postgres-on-1.vm.cumuli.be, dmvb-postgres-on-1.vm.cumuli.be, dnsextern-postgres-on-1.vm.cumuli.be, dnsmasterextern-postgres-on-1.vm.cumuli.be, docstore-postgres-on-1.vm.cumuli.be, dovbemaling-postgres-on-1.vm.cumuli.be, dovbodenstat-postgres-on-1.vm.cumuli.be, dovdeelfstoffen-postgres-on-1.vm.cumuli.be, dovgeoserverinspireconfig-postgres-on-1.vm.cumuli.be, dovgeoserverinspiredata-postgres-on-1.vm.cumuli.be, dovgeoserverintermconfig-postgres-on-1.vm.cumuli.be, dovgeoserverpubliekconfig-postgres-on-1.vm.cumuli.be, dovgeoserverpubliekdata-postgres-on-1.vm.cumuli.be, dovgeoserverwerk-postgres-on-1.vm.cumuli.be, dovgwdata-postgres-on-1.vm.cumuli.be, dovghi-postgres-on-1.vm.cumuli.be, dovijm-j-postgres-on-1.vm.cumuli.be, dovinstrument-postgres-on-1.vm.cumuli.be, dovintembodem-postgres-on-1.vm.cumuli.be, dovinterngeologie-postgres-on-1.vm.cumuli.be, dovinterngrondwater-postgres-on-1.vm.cumuli.be, dovinternocdov-postgres-on-1.vm.cumuli.be, dovinvloedbemalingmetadata-postgres-on-1.vm.cumuli.be, dovinvloedbemalingmodel-postgres-on-1.vm.cumuli.be, dovocdov-postgres-on-1.vm.cumuli.be, dovondiepvoxelmodel-postgres-on-1.vm.cumuli.be, dovportaal-postgres-on-1.vm.cumuli.be, dovsensor-postgres-on-1.vm.cumuli.be, dovtracing-postgres-on-1.vm.cumuli.be ...
<input type="checkbox"/>	zabbixproxy-on-2	Active	PSK	On	5s	517	75377	307.98	acdrupal-on-1.vm.cumuli.be, amqp-on-1.vm.cumuli.be, amqp-on-2.vm.cumuli.be, amqp-on-3.vm.cumuli.be, apache2-cdn-on-1.vm.cumuli.be, apache2-on-1.vm.cumuli.be, apex-on-1.vm.cumuli.be, archief-algemeen-on-1.vm.cumuli.be, archief-dsi-on-1.vm.cumuli.be, archief-imjv-authentication-proxy-on-1.vm.cumuli.be, archief-imjv-authentication-proxy-on-2.vm.cumuli.be, archief-imjv-on-1.vm.cumuli.be, archief-omv-on-1.vm.cumuli.be, barman-on-1.vm.cumuli.be, bed-on-1.vm.cumuli.be, bredero-acc1-on-1.vm.cumuli.be, bredero-acc2-on-1.vm.cumuli.be, bredero-bup-on-1.vm.cumuli.be, bredero-on-1.vm.cumuli.be, bsos-elasticsearch-on-1.vm.cumuli.be, bsos-maildev-on-1.vm.cumuli.be, bsos-on-1.vm.cumuli.be, bsos-rest-on-1.vm.cumuli.be, cbb-on-1.vm.cumuli.be, configserver-oauth-on-1.vm.cumuli.be, configserver-oauth-on-2.vm.cumuli.be, configserver-on-1.vm.cumuli.be, configserver-on-2.vm.cumuli.be, confluence-on-1.vm.cumuli.be, crucible-on-1.vm.cumuli.be, dali-on-1.vm.cumuli.be, data-ingest-on-1.vm.cumuli.be, data-ingest-on-2.vm.cumuli.be, database-migration-manager-on-1.vm.cumuli.be, datamanager-geoserver-on-1.vm.cumuli.be, datamanager-pres-on-1.vm.cumuli.be, datamanager-services-on-1.vm.cumuli.be, datamanager-ssh-on-1.vm.cumuli.be, datasets-on-1.vm.cumuli.be, dba-lod-populator-client-on-1.vm.cumuli.be, dba-lod-populator-on-1.vm.cumuli.be, do4-oracle-on-1, demo-on-1.vm.cumuli.be, demoapp-on-1.vm.cumuli.be, dierenwelzijn-dossierbeheer-on-1.vm.cumuli.be, dms-on-1.vm.cumuli.be, dms-solr-on-3.vm.cumuli.be, dmvb-on-1.vm.cumuli.be, dmvb-on-2.vm.cumuli.be, dns-extern-on-1.vm.cumuli.be ...

Displaying 2 of 2 found



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Status		
Parameter	Value	Details
Zabbix server is running	Yes	dc1-zabbix1.cumuli.be:10051
Number of hosts (enabled/disabled)	2383	2356 / 27
Number of templates	88	
Number of items (enabled/disabled/not supported)	420019	414305 / 5474 / 240
Number of triggers (enabled/disabled [problem/ok])	102077	97843 / 4234 [103 / 97740]
Number of users (online)	86	7
Required server performance, new values per second	1796.65	
Database history tables upgraded	No	
Database history tables use primary key	No	

System Status				
Host group	Disaster	High	Average	Warning
Backup			2 of 2	
oefen		14 of 14	5 of 8	7 of 7
ontwikkel		8 of 12	4 of 4	3 of 3
PostgreSQL		1 of 1		3 of 3
productie		8 of 8	3 of 3	7 of 10
Team_Infra		10 of 10	2 of 2	2 of 5
Webservices				1 of 1

#### Status Zabbix Proxies



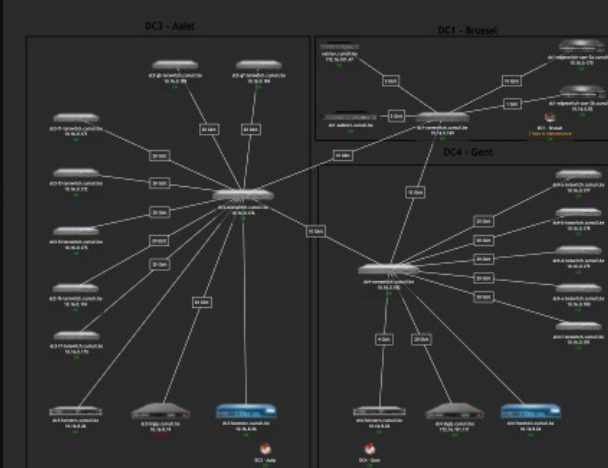
#### Web monitoring

Host group	Ok	Failed	Unknown
Webservices	70	1	

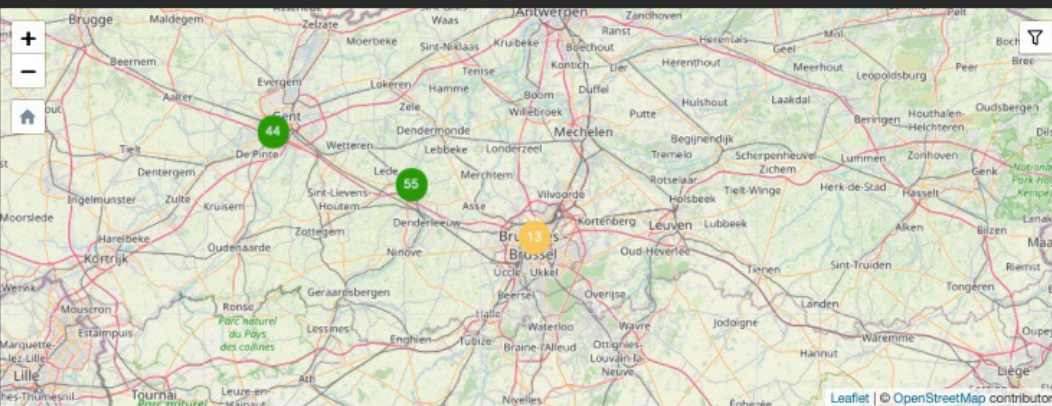
#### Host availability

	Available	Not available	Unknown	Total
Zabbix agent	2077	4	22	2103
SNMP	28	0	6	34
JMX	1018	30	5	1053
IPMI	2	0	0	2

#### Network



#### Datacenter Locations



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# Future Actions

## ► Apply Foreman's Ansible plugin

- Import current roles and (default) vars
- Host-group/host
  - × Select roles to execute after provisioning
- Specific roles can be executed
- Results of roles are logged within Foreman
  - × Easy overview of status (success/failed) and details



# Thank You

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