Zabbix on a Clouds

Another approach to a building a fault-resilient, scalable monitoring platform



Preface...

We will be discussing a few topics on how you will deploy or migrate Zabbix monitoring from the standalone installation to the cloud. Or if you already deploy the Zabbix on the Cloud environment, we will talk about how you can improve your installation.

All in all, due to a time constrain, I will not give you a "architecture ready to implement", but shall rather to demystify the whole idea of the "cloud deployment" and inspire you to ether review the architecture of your existing cloud-deployed Zabbix, or to stop worrying and move to the Clouds.

Let's roll

What you may have now

I've seen that the great many Zabbix installations are never fully evolved from this classic architecture. Administrators usually started from the "simple, test setup" and continue to use the same architecture for the years to come. And at some point, moveing the same architecture to the cloud and thinking that they are "clouddeployed".



What's wrong with this picture ?

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Everything is wrong

This architecture isn't scalable

This architecture isn't fault tolerant

This architecture requires a lot of attention and manual interventions when deployed.





some cloud facts ...

laaS

"Infrastructure as a Service". This is computing and network infrastructure, delivered for our project "on demand"

- **PaaS** "Platform as a Service". This is a capability for deploying custom applications onto the cloud infrastructure.
- **SaaS** "Software as a Service". Capability of using a cloud applications deployed on the public or private cloud infrastructure.

and how this is all applicable ?

laas	PaaS	SaaS
 Computing resources Disk resources Network resources 	 Database Zabbix server Zabbix proxy JMX gateway Zabbix frontend 	 Schedulers Container engines Message delivery Message queues Job queues External aggregations External dashboards External reports

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What's important

Scale

Architecture shall be scalable "in" and "out", without unnecessary interventions.

Fault-resistance

Everything will fail ! We do not know when ! Maybe now.

Decoupling

Avoid pre-arranged network configurations because everything will fail and you must use "loose" pointers to the resources.

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What's is different



Resource discovery

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Engine: Containers hosting and execution platform.

Fault tolerance: Schedulers.

Resource discovery: DNS connector.

Message queues and delivery: Decoupling.





Inside container orchestration

In the Docker container, it shall be only one "Entry point"

http://supervisord.org/



In-container decoupling

In the cloud, you may have a multiple places where your service might be running. "Service discovery" will help you in some cases, like finding where your Zabbix Server is now running or where is your Zabbix Proxy, but for the case of providing "last mile" connection to the pool of the databases, or other Zabbix components, you do need a mechanism for "in-container decoupling"

http://www.haproxy.org/

https://sourceforge.net/p/octopuslb/wiki/Home/

It's all about database



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Then it's all about computing

While deploying application on the cloud, the one must think "like a cloud". One of the important attributes of the Cloud is elasticity. Always remember, you can dynamically scale-in and scale-out.



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Dynamic nature of the cloud deployments requires that you shall provision distributed resource manager, application execution scheduler and a resource discovery as a cloud software service.



···manage your resources !

Your computing environment gives you a resources, such as CPU, memory, etc ...





··· take care of HA

Your SaaS must provide you a capacities for running "legacy" application in "High-Availability" manner, detect failed nodes in the cluster, migrate application to surviving nodes and manage the state of the HA environment.



what is "legacy application" ?

None of the Zabbix native components, such as Zabbix Server, Zabbix Proxy, JMX gateway, Zabbix Agent are "cluster-aware" application. So, the SaaS solution of your choice, must take care of all details without any expectations from the application itself.



it is

Considering the fact, that none of the standard components of the Zabbix Framework are nether cluster, nor cloud aware, you can not rely on the cloud solution for the resource discovery, which is not available for a "legacy applications". The most common way for propagate information on which node you have the specific resource, is use the DNS connector service. This service is usually part of the most popular platforms.

Now, let's discuss some basic approaches to the architecture of the Zabbix components deployed on the cloud







Z-proxy



JMX gateway



an Agent







Frontend LB



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MESOS - distributed resource manager

MARATHON - Marathon is a productiongrade container orchestration platform for Mesosphere's MESOS





DOCKER - platform to build, ship and run distributed applications.

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mesos-dns - service discovery application, executing by the Marathon and running inside MESOS cluster. mesos-dns resolves application names to the addresses of the nodes on which application instances are launched.

https://mesosphere.github.io/mesos-dns/



Apache ZooKeeper is an effort to develop and maintain an open-source server which enables highly reliable distributed coordination.

https://zookeeper.apache.org/





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NOMAD is a tool for managing a cluster of machines and running applications on them.

https://www.nomadproject.io/



CONSUL is a tool, which will work alongside with Nomad and provide a several services important for our Zabbix cloud architecture, such as Service Discovery, Health Checking and multiple Datacenter support.

https://www.consul.io/

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- docker

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And yes, you are still going to need the Docker. Please make sure that you are running the local Docker registry. IMHO, it is a good idea to run this registry on the cluster, alongside with your application, just make sure that you do have enough resources for that. Or you can choose to run registry on dedicated cluster. As long as it's a faultresistant, you will be fine.



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Who is watching the watcher

It is generally a good idea to deploy an independent instance of the Zabbix, which will monitor the existence and a health of main Zabbix



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What else is missing?

The support infrastructure, of course !

Think about this for a second. Your monitoring platform, most likely the last piece of the software which suppose to still standing during the "hard times". This means, that your Zabbix shall be absolutely, unquestionably self-reliant. It shall not be dependent on any of your corporate service. This includes SSO, DNS, deployment and Docker registry. You must assume at all time, that none of those major services will not be available for your Zabbix, because Zabbix is monitoring them. So, make sure that you are self-contain them for your Zabbix cluster.

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Never forget about security and a safety of your Zabbix. There are some ideas that you can employ on your Zabbix on a Clouds:

- Separating database and cluster infrastructure in a different VPC and control access between those VPC's;
- Secure access to your Zabbix internal VPC reserved for administrative personnel;
- Zabbix database holding lot's of sensitive data. Think about encryption of the database and/or volume.
- Use encryption for the traffic between Server and Proxies. Use the certificates, not PSK.
- Use Vaults for storing sensitive configuration files, such as zabbix_server.conf

Questions?





This presentation is not intended to teach you on how to set and configure the global cluster. But I rather focused on how you can approach Zabbix architecture on the cloud and which tools to try first, if you do not know where to start.

As with any architecture, those recommendations are purely educational as each installation and situation are different. There are another approaches and a choices of the software to tackle that approach, but as I hope, you've got enough out of this 20 minute talk to start thinking about your "Zabbix on the cloud". And if you'll have any questions, I will try to answer them for you.

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고맙습니다 Je vous remercie ! Tak !

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Děkuji !

Danke !

Большое спасибо!



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