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Two Approaches to vSphere Monitoring Using InfluxDB and Telegraf

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Your applications rely on a performant and highly available infrastructure, so it is important to implement effective vSphere monitoring. vSphere (formerly VMware Infrastructure 4) is VMware's cloud computing virtualization platform. vSphere monitoring helps increase the availability of your servers, services, and applications, help you detect server and OS failures, reduce deployment times, and help with centralized configuration to reduce administrative overhead.

When it comes to monitoring, there are those who proactively monitor or seek to improve their system monitoring, and those who maintain an indifferent attitude, convincing themselves that everything in their environment is fine when it really isn't. Taking on a proactive monitoring approach, the two vSphere monitoring solutions proposed here (both deploying InfluxDB and Telegraf) are based on open source technology, so getting started is simple and free:

- The first approach uses Grafana for visualization, as vExpert, InfluxAce, and prolific blogger Jorge de la Cruz demonstrates in the Modern vSphere Monitoring and Dashboards Using InfluxDB, Telegraf and Grafana webinar. This monitoring solution can be deployed in seconds using Docker, and uses the vSphere SDK, which makes it non-intrusive and very efficient. Beautiful and meaningful dashboards can be created from vSphere's most critical assets like hosts, VM's, clusters, and data stores.
- The second approach uses the vSphere Monitoring Template, an InfluxDB Template created by Ignacio Van Droogenbroeck, InfluxAce and Founder's Choice Award winner at the 2020 InfluxData Community Awards. The InfluxDB Template provides a pre-configured dashboard with information about your vSphere host.

To put vSphere monitoring in context, here's a quick overview of vSphere components.

vSphere components include:

- **ESXi** a type of hypervisor that runs on host systems to manage the execution of VMs, allocating resources as needed
- **vCenter Server** the central point for creating VMs, starting and stopping VMs, and performing other management tasks

- **vCenter Client** a Windows application that allows you to access vCenter Server remotely
- VMFS the vSphere file system to manage disk resources

First approach: InfluxDB, Telegraf and Grafana

An easy way to monitor vSphere is by using InfluxDB, Telegraf and Grafana:

- InfluxDB is an open-source time series database where the different metrics written by Telegraf are stored.
- Telegraf is a plugin-driven server agent for collecting and reporting metrics; it has different integrations out-of-the-box, and vSphere is among them. The VMware vSphere plugin uses the vSphere API to gather metrics from multiple vCenter servers.
- Grafana is an open-source and widely adopted dashboarding system which represents the information stored on different data sources. InfluxDB is one of the supported data sources for Grafana.



How to start monitoring vSphere

Telegraf retrieves all the information from vCenter using the SDK (API-driven)

The data flow is as follows:

- Telegraf has over 200 plugins, enabling you to pull data out from various sources.
- The data is then stored in InfluxDB, a robust, real-time time series database that can easily handle millions of metrics.
- Grafana, the dashboarding engine, visualizes all the metrics being consumed and stored in InfluxDB.



By enabling [[inputs.vsphere]] from vCenter, you can start downloading metrics.

Another collector option is vSAN Performance Monitor, a monitoring and visualization tool based on vSAN Performance metrics. The vSAN performance monitor is delivered in a virtual appliance with Telegraf collector, InfluxDB, and Grafana frontend included, and with extra dashboards for vSAN but under VMware itself – everything is pre-configured.

Next, download the ready-to-consume Grafana dashboards.

Below is the Telegraf configuration to start ingesting information from vSphere SDK.





Telegraf configuration to start ingesting information from vSphere SDK

How vCenter stores metrics

vCenter stores metrics in two ways: real-time (real-time instance) and not real-time (historical instance).



How VMware vCenter saves information and metrics

vCenter saves metrics every 20 seconds in the ESXi RAM. This is perfect to query these metrics much more often, as it is quick:

- These metrics are stored for a maximum of one hour (real-time in vSphere Client).
- This is limited to ESXi and VMs metrics, such as CPU, RAM, Networking, etc.

vCenter saves Datastore, Cluster and Datacentre metrics in ranges of 5 minutes, 30 minutes, 2 hours, and 24 hours. This is perfect to query these metrics every x hours:

- These metrics are stored in the vCenter Server Database, and it is quite heavy to pull if frequency is low.
- This is limited to Datastores, Cluster, and Datacentre.

Dashboards available for this solution

Available for download for this solution are the following dashboards (all created by Jorge de la Cruz (referenced on page 1) to gain full Host and Datastore visibility. These dashboards use the Telegraf plugin (Grafana 7).



VMware vSphere - Overview



VMware vSphere - Datastore



VMware vSphere - Hosts



VMware vSphere - VMs

Second approach: InfluxDB, Telegraf and vSphere Monitoring Template

The second approach also involves using InfluxDB for metrics storage and Telegraf for metrics collection, but uses the vSphere Monitoring Template for visualization. This template is an InfluxDB Template that packages up everything needed to monitor – Telegraf configurations and InfluxDB Dashboards, Tasks, Alerts, and related artifacts – into a single YAML text file. The file can be imported into InfluxDB with a single command.

The ease of using InfluxDB Templates

InfluxDB Templates free individuals and teams to <u>easily share their monitoring expertise</u> and quickly get their monitoring solutions up and running.

InfluxDB Templates define the following:

- Telegraf configuration files
- InfluxDB dashboards
- InfluxDB alerts
- InfluxDB buckets, labels, and variables

Because InfluxDB Templates can be imported with one command, they save hours of tedious, error-prone copying and pasting of configuration information.



InfluxDB Templates and the influx pkg command are available for InfluxDB OSS 2.0 and InfluxDB Cloud. There is no additional charge for using InfluxDB Templates.

vSphere monitoring dashboard

Key vSphere metrics to track

Key vSphere monitoring metrics to track with the vSphere Monitoring Template, whose dashboard is shown above, include:

- Uptime
- CPU
- RAM
- Network Usage
- Total Disk Latency (Write and Read)
- Storage Adapter Latency

How to use vSphere Monitoring Template

Once your InfluxDB credentials have been properly configured in the CLI, you can install the vSphere monitoring template using the Quick Install command:

• Once the template is installed, the data for the dashboard will be populated by the included vSphere Telegraf configuration, which contains the relevant vSphere Input.

- The VMware vSphere plugin uses the vSphere API to gather metrics from multiple vCenter servers.
- You might need to customize the input configuration to better serve your needs, including by specifying a new input value. All of this will depend on how your organization currently runs vSphere.

Find out more about environmental variables within the Telegraf configuration.

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