

Docker Container Monitoring Dashboards

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Docker Monitoring

Docker has a built-in stats command that makes it simple to see the amount of resources your containers are using. Just drop `$ docker stats` in your CLI and you'll get a read out of the CPU, memory, network, and disk usage for all your running containers.

- But this command only gives you a current moment in time.
- What if you wanted to see the evolution of the resources over time?
- Or see how much CPU and memory a Docker Compose project is using?
- Or sort containers by the most CPU-intensive, then filter by CPU usage over 80%?

Docker Monitoring Dashboard

Docker monitoring dashboards provide a visual representation of the performance and health of Docker containers. These dashboards can be used to monitor container metrics, such as CPU usage, memory usage, and network traffic, as well as container logs and events.

Why monitor Docker containers?

Well, like other infrastructure monitoring can help to give visibility to issues, problems, or other metrics that need to be addressed as part of your application performance monitoring.

Docker monitoring tools allow you to monitor docker and key metrics that shed light on anomaly detection, performance issues, stability issues, or just overall sanity checks of your containerized applications to make sure everything is running as expected.

Performance Monitoring

- Monitor container performance metrics, such as CPU usage, memory usage, and network I/O
- Using the info to identify bottlenecks and improve container performance
- Use tools like Prometheus and Grafana to collect and visualize performance metrics.

Security Monitoring

- Monitor container security metrics, such as network traffic and system processes
- Help identify potential security threats and vulnerabilities

Docker Monitoring Tools

There are several tools available for monitoring Docker containers, including:

- Docker Stats
- Resources Usage extension
- cAdvisor
- Node Exporter
- Prometheus
- Grafana

Docker Stats

A command-line tool that provides real-time statistics about running containers.

- Using Docker's stats command, you get a live view of the resources used by your containers. Every running container can be analyzed using this tool to determine its CPU, memory, network, and disk utilization.
- To use the command, open a terminal and run the `docker stats` command:

```
$ docker stats
CONTAINER CPU % MEM USAGE / LIMIT MEM % NET I/O BLOCK I/O
redis1 0.07% 796 KB / 64 MB 1.21% 788 B / 648 B 3.568 MB / 512 KB
redis2 0.07% 2.746 MB / 64 MB 4.29% 1.266 KB / 648 B 12.4 MB / 0 B
```

- You can find out more about this command in the Docker documentation.

Resource Usage extension

- Provides detailed metrics about container resource usage.
- Can be used to monitor container performance and identify resource bottlenecks.
- Can be used to monitor container logs and events.
- It is an extension for Docker Desktop.

cAdvisor

cAdvisor (Container Advisor) is a tool that provides real-time monitoring and a view of resource usage and performance metrics for containers. It helps you to see CPU, memory, network, and disk statistics related to your containers.

Node Exporter

Node Exporter is an agent for exposing system-level metrics about the Docker container host. It gives you metrics such as CPU, memory, disk, and network usage for your host. It can export these statistics to Prometheus for monitoring physical and virtualized servers.

Prometheus

Prometheus is a monitoring and alerting tool that collects metrics from systems and services and then it stores them in a time-series database. You can then set up alerts based on those metrics. Data can be scraped from exporters like Node Exporter and cAdvisor and sent to Grafana or some other log management solution

Grafana

Grafana is a visualization tool that easily allows you to have visually appealing dashboards and it integrates with data sources like Prometheus. The dashboards can provide a view of real-time data for monitoring metrics. You can customize the look of graphs and visualizations for analyzing performance metrics and tracking performance issues

Monitoring with cAdvisor, Node Exporter, Prometheus and Grafana

1. Install cAdvisor and Node Exporter on a server.
2. Configure cAdvisor to collect metrics about container resource usage.
3. Configure Node Exporter to collect metrics from cAdvisor.
4. Configure Prometheus to scrape metrics from Node Exporter.
5. Create a dashboard in Grafana to visualize the metrics collected by Prometheus.
6. Use the dashboard to monitor container metrics and identify performance issues.

