Kubernetes Tools & Usages

1. Kubelet

- Kubelet acts as a bridge between the master and the nodes
- It is the primary node agent that runs on each node and maintains a set of pods.
- Kubelet watches for PodSpecs via the Kubernetes API server and collects resource utilization statistics and pod and events status.

2.Grafana Best Tool

- Grafana is a multi-platform open source solution for running data analytics, pulling up metrics that make sense of the massive amount of data, and monitoring apps through customizable dashboards.
- **Pros**: Large ecosystem, rich visualization capabilities, alerting
- **Cons**: Not optimized for Kubernetes log management

3. Prometheus best tool

- Prometheus is one of the most popular monitoring tools used with Kubernetes.
- It's community-driven and a member of the Cloud Native Computing Foundation.
- This project, developed first by SoundCloud and afterward donated to the CNCF, is inspired by Google Borg Monitor and Version 1.in 2016.
- **Pros**: Kubernetes-native, simple to use, huge community
- **Cons**: Challenges at scale, storage

4. Datadog for services and events

- Datadog allows you to collect metrics, events, and service states from Kubernetes service in real time.

- You can then, visualize and correlate the data with beautiful graphs, and set flexible alerting conditions without running any storage or monitoring infrastructure yourself

5. **Container Advisor (cAdvisor)**

- cAdvisor is a container resource usage and performance analysis agent; it's integrated into the Kubelet binary

- cAdvistor auto-discovers all containers in a machine and collects statistics about memory, network usage, filesystem, and CPU.

  - **Pros**: Built *into* Kubernetes, easy to use
  - **Cons**: Basic, lacks analytical depth, limited functionality

6. **Kubernetes Dashboard**

- Kubernetes Dashboard is a web-based, UI add-on for Kubernetes clusters.
- It has many features that allow users to create and manage workloads as well as do discovery, load balancing, configuration, storage, and monitoring.

- It is helpful for small clusters and for people starting to learn Kubernetes.

6. **Weave Scope**

- It is a monitoring tool developed by the folks at Weave works.

- It generates a map of processes, containers, and hosts in a Kubernetes cluster to help understand Docker containers in real time.

- Best Feature : It can also be used to manage containers and run diagnostic commands on containers without leaving the graphical UI.

  - **Pros**: User interface, zero-configuration
  - **Cons**: Lacks analytical depth

7. **The ELK Stack**

   - For logging Kubernetes, the most popular open source monitoring tool is, of course, the ELK Stack.

   - An acronym for Elasticsearch, Logstash and Kibana, ELK also includes a fourth component — Beats, which are lightweight data shippers.

   - **Pros**: Huge community, easy to deploy and use in Kubernetes, rich analysis capabilities

   - Difficult to maintain at scale

Other More Tools

8. **Sumo Logic App for Kubernetes for Deployment**

   - Sumo Logic App for Kubernetes allows you to monitor Kubernetes deployments.
   - Preconfigured dashboards present resource-related metrics at the Kubernetes pod, cluster, and namespace level; and provide operational insight into Kubernetes components, including nodes, the API Server, the Controller Manager, the Kube System, and the Scheduler.
   - New Relic Infrastructure

9. New Relic Infrastructure for Full Application

- New Relic Infrastructure on-host integration for Kubernetes, provides deep monitoring of the container orchestration layer
- It collects metrics that monitor data and metadata for nodes, Namespaces, Deployments, ReplicaSets, Pods, and containers
- so you can fully monitor your frontend and backend applications and hosts running in your Kubernetes clusters

10. Heapster

- Heapster is an add on to Kubernetes that collects and forwards both node, namespace, pod and container level metrics to one or more "sinks" (e.g. InfluxDB). It also provides REST endpoints to gather those metrics.
- The metrics are constrained to CPU, filesystem, memory, network and uptime.

11. Kube-State-metrics

- Kube-state-metrics listens to the Kubernetes API server and generates metrics about the state of numerous Kubernetes objects, including cron jobs, config maps, pods, and nodes

- These metrics are unmodified, unlike kubectl metrics that use the same Kubernetes API but apply some heuristics to display comprehensible and readable messages.