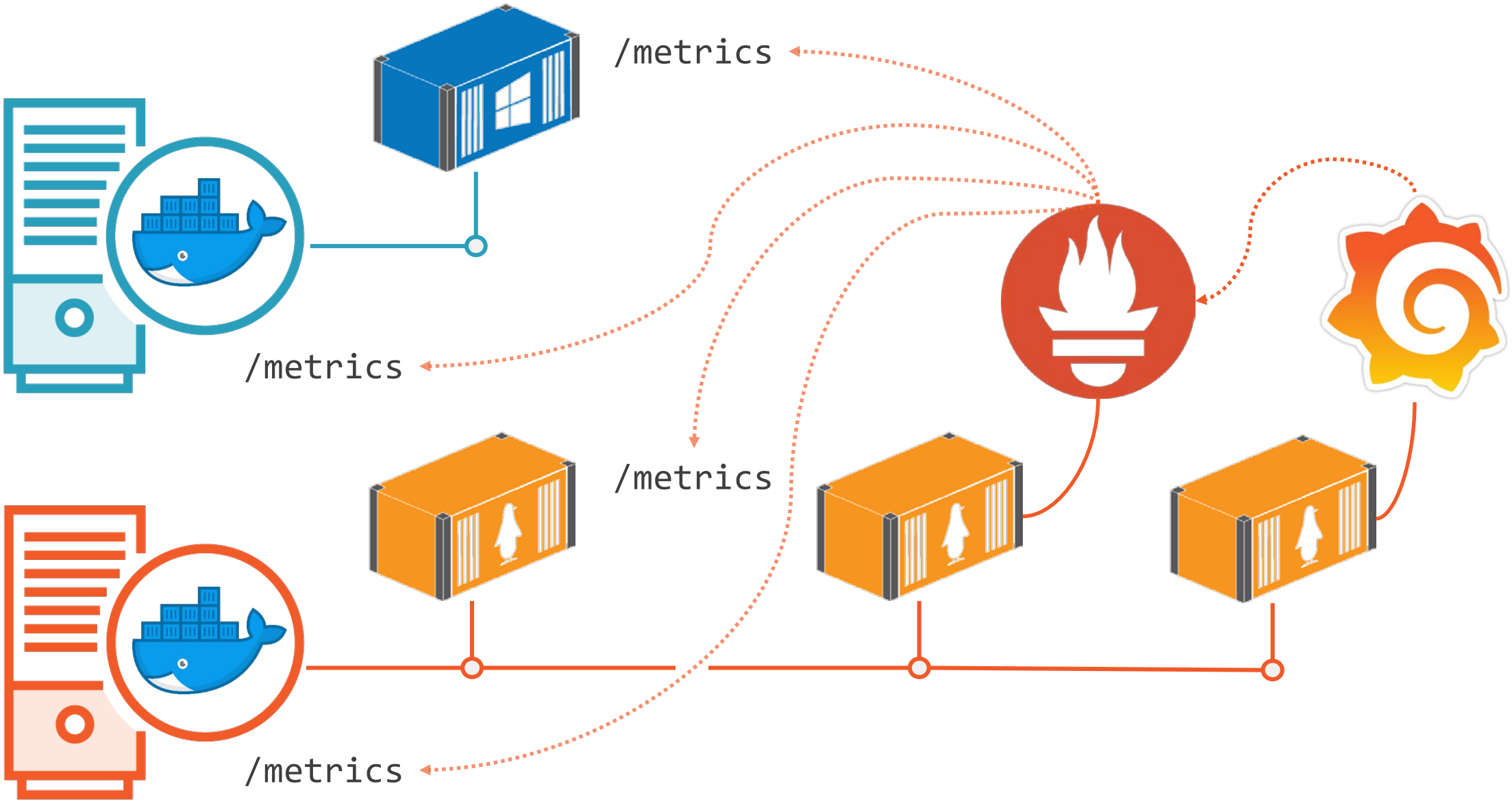
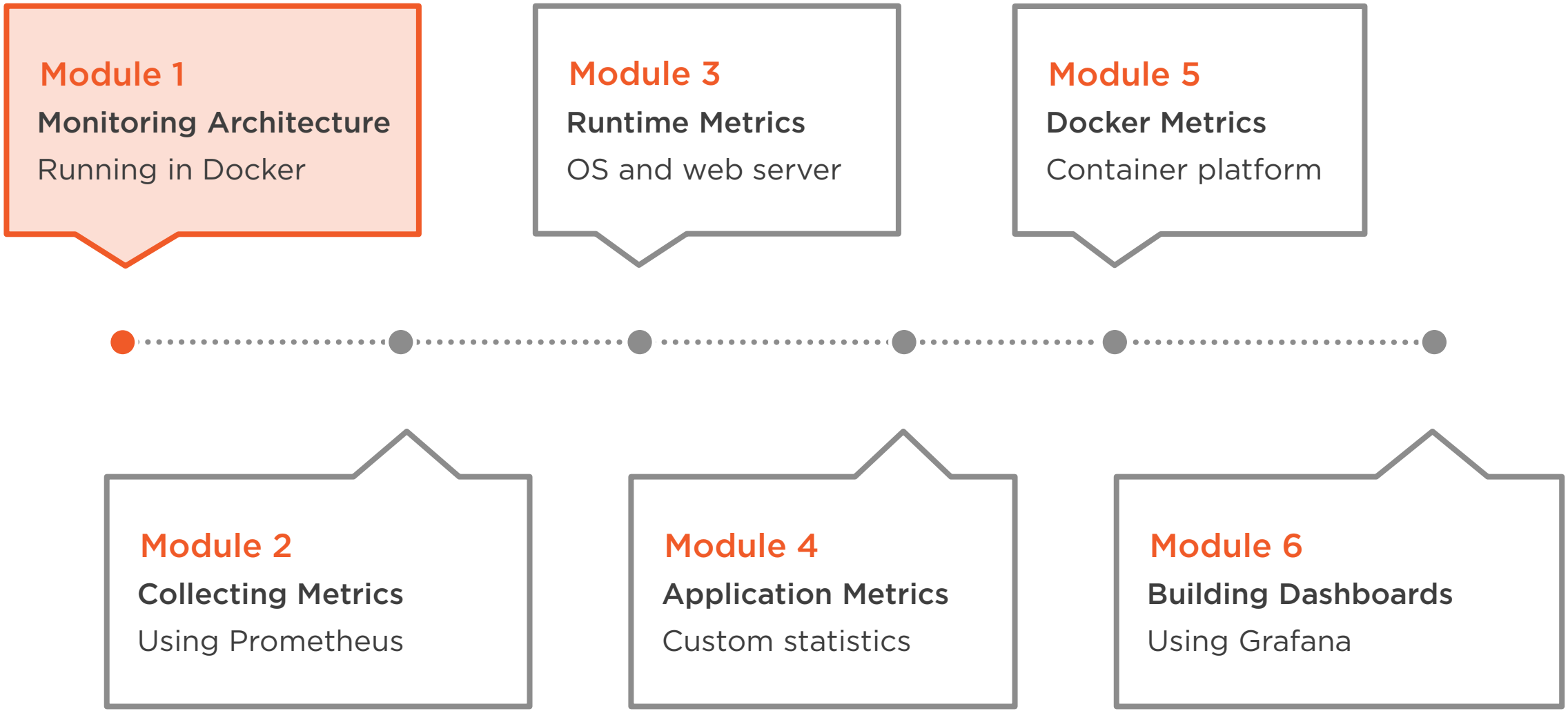
Monitoring Containerized Application Health with Docker

ARCHITECTING MONITORING FOR CONTAINERIZED APPLICATIONS

Elton Stoneman
DEVELOPER ADVOCATE

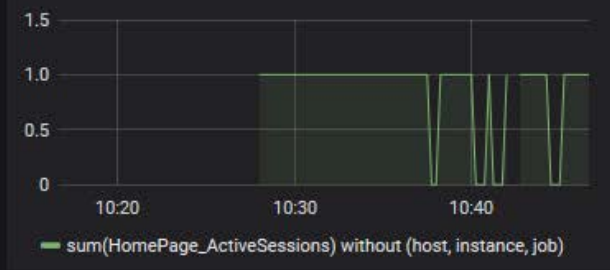
@EltonStoneman https://blog.sixeyed.com


/metrics
/metrics
/metrics
/metrics


Module 1
Monitoring Architecture
Running in Docker
Module 3
Runtime Metrics
OS and web server
Module 5
Docker Metrics
Container platform
Module 2
Collecting Metrics
Using Prometheus
Module 4
Application Metrics
Custom statistics
Module 6
Building Dashboards
Using Grafana

Application Metrics

Customer Sessions



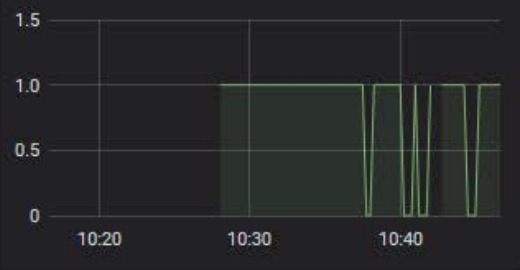
Customer Ord...

15

Cart Items

43

Management Sessions

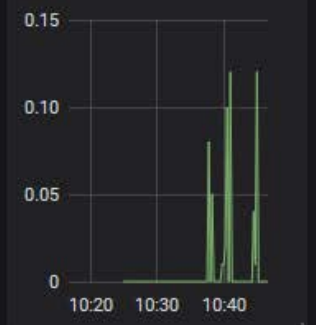


Stock Orders

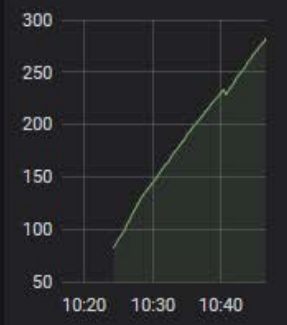
7

Runtime Metrics

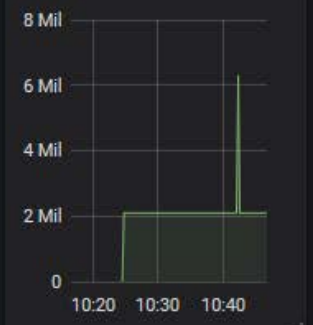
IIS Requests/sec



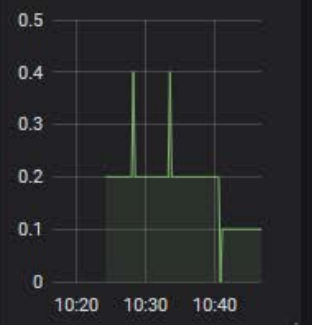
.NET CPU Time



.NET Heap Size



Tomcat Requests/sec



JVM Heap Size

Tomcat CPU Seconds

Docker Metrics

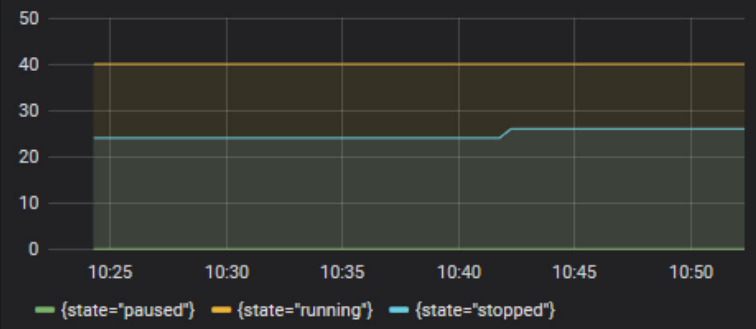
Nodes Online

4

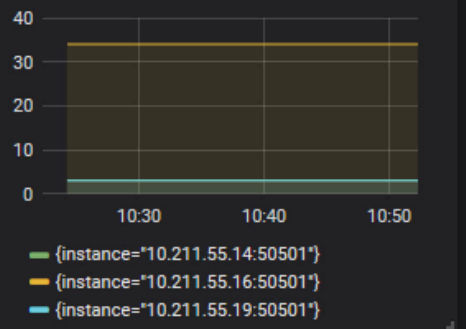
Nodes Offline

0

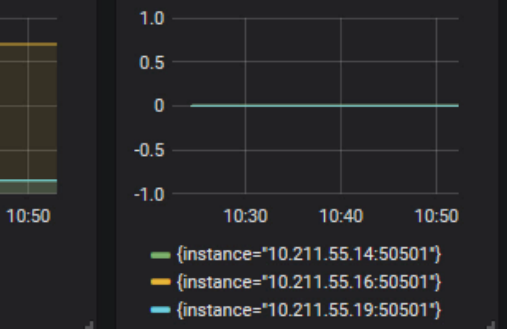
Container States

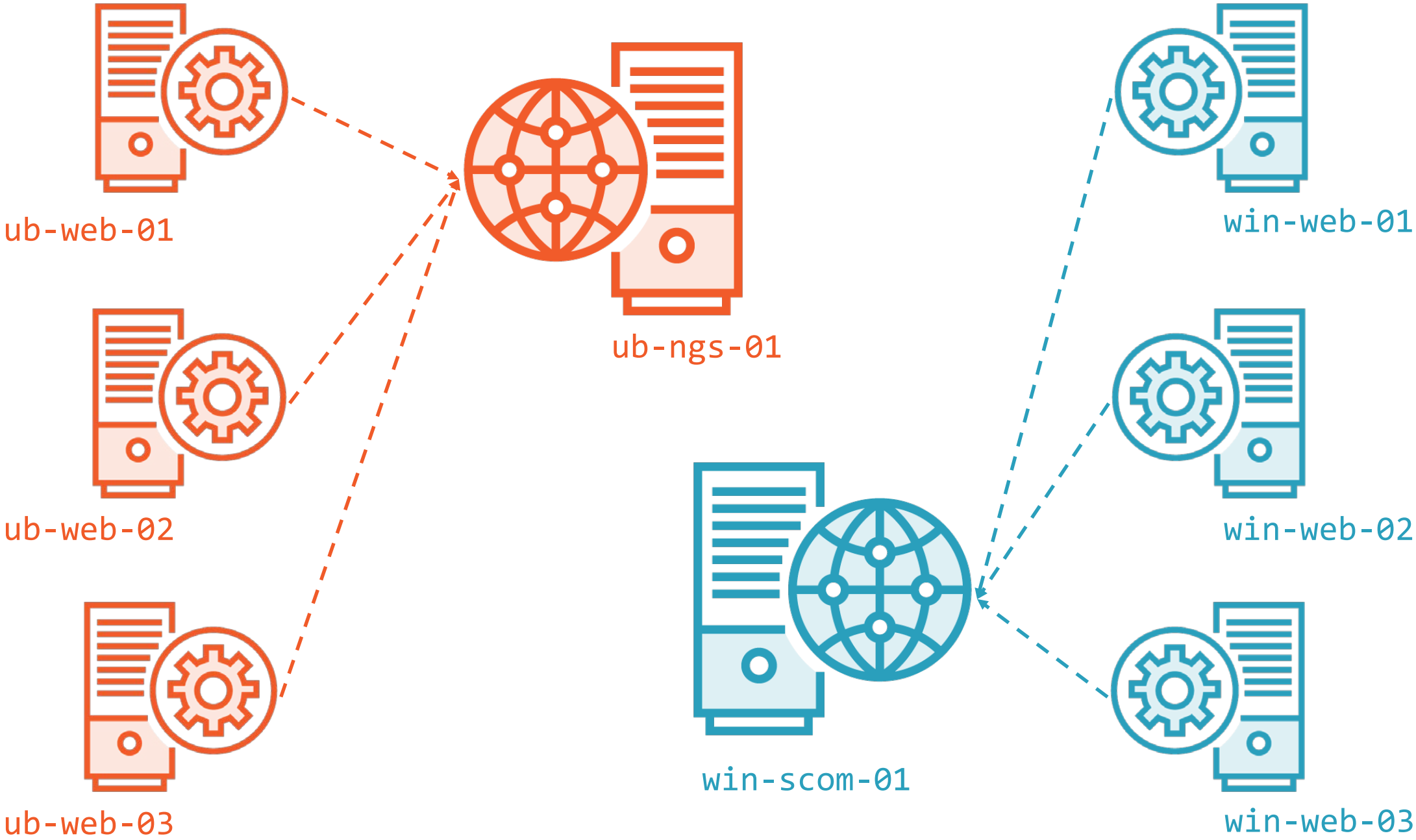


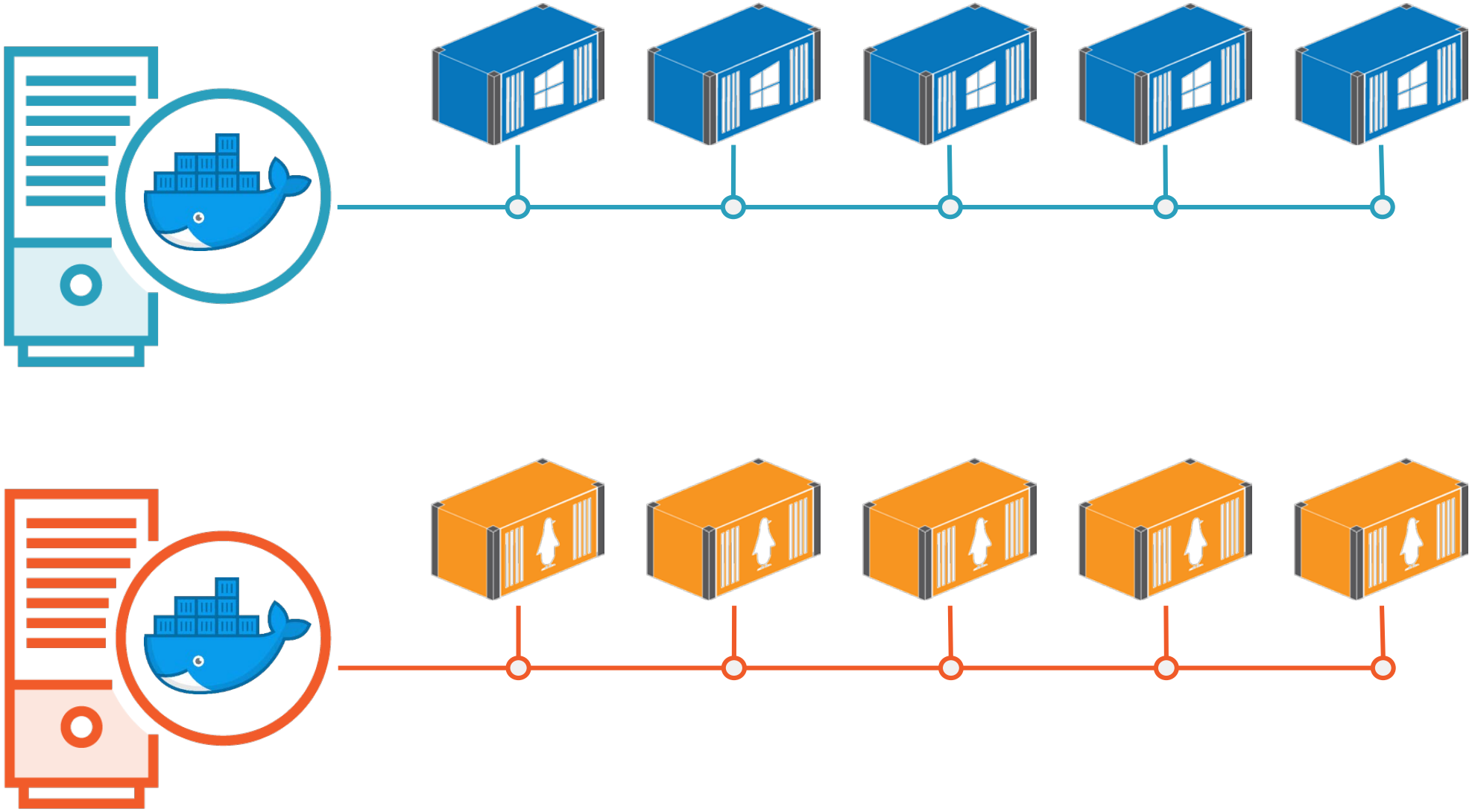
Running Containers

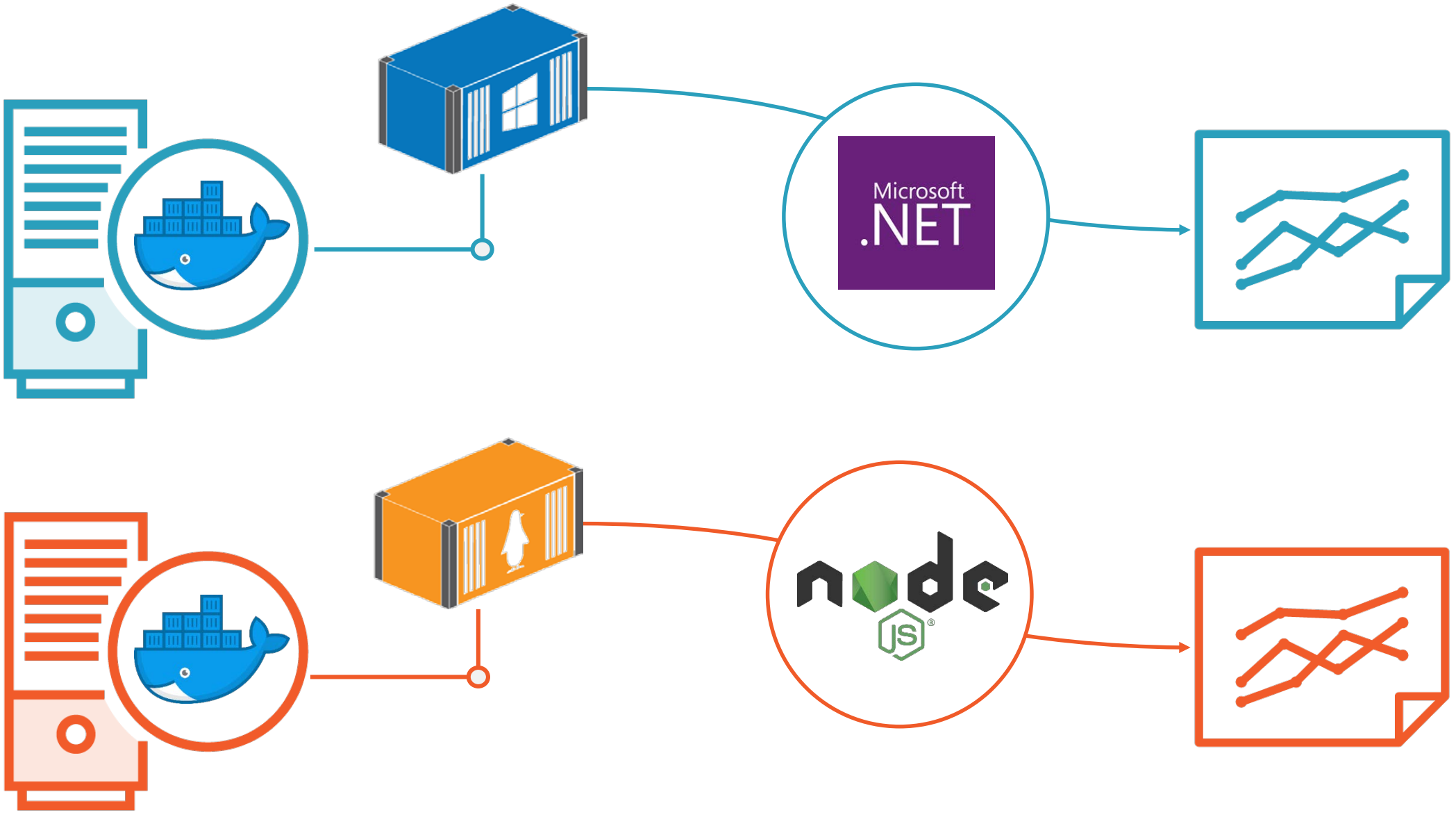


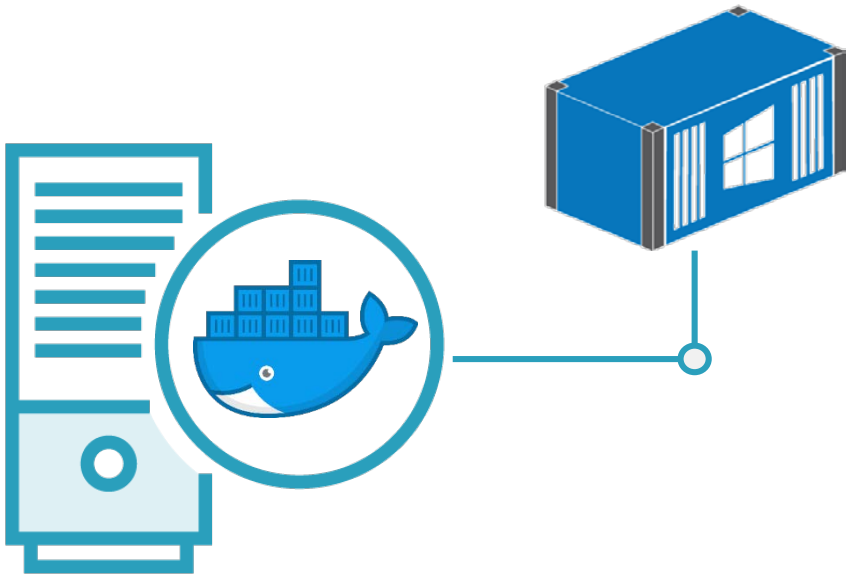
Failed Healthchecks




ub-web-01
ub-web-02
ub-web-03
ub-ngs-01
win-scom-01
win-web-01
win-web-02
win-web-03

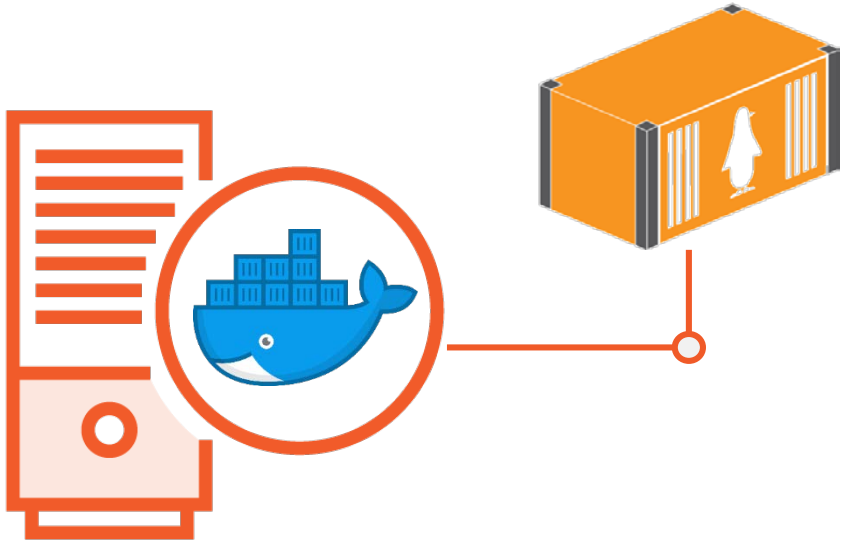



Microsoft
.NET
node
JS



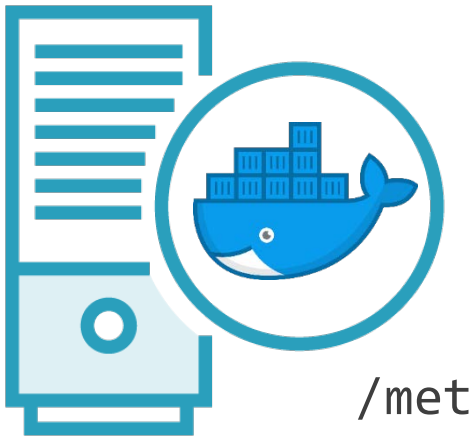
/metrics

```
# HELP process_thread_count Thread Count Perf Counter
# TYPE process_thread_count GAUGE
process_thread_count{host="EC38E36F18DE"} 21
# HELP dotnet_clr_memory_gen_0_heap_size Gen 0 heap size
# TYPE dotnet_clr_memory_gen_0_heap_size GAUGE
dotnet_clr_memory_gen_0_heap_size{host="EC38E36F18DE"} 2097152
```

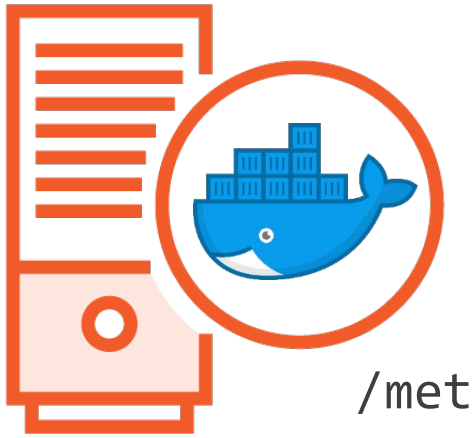


/metrics

```
# HELP jvm_threads_current Current thread count
# TYPE jvm_threads_current gauge
jvm_threads_current 37.0
# HELP jvm_memory_bytes_committed Committed bytes
# TYPE jvm_memory_bytes_committed gauge
jvm_memory_bytes_committed{area="heap",} 2.47463936E8
jvm_memory_bytes_committed{area="nonheap",} 3.8273024E7
```

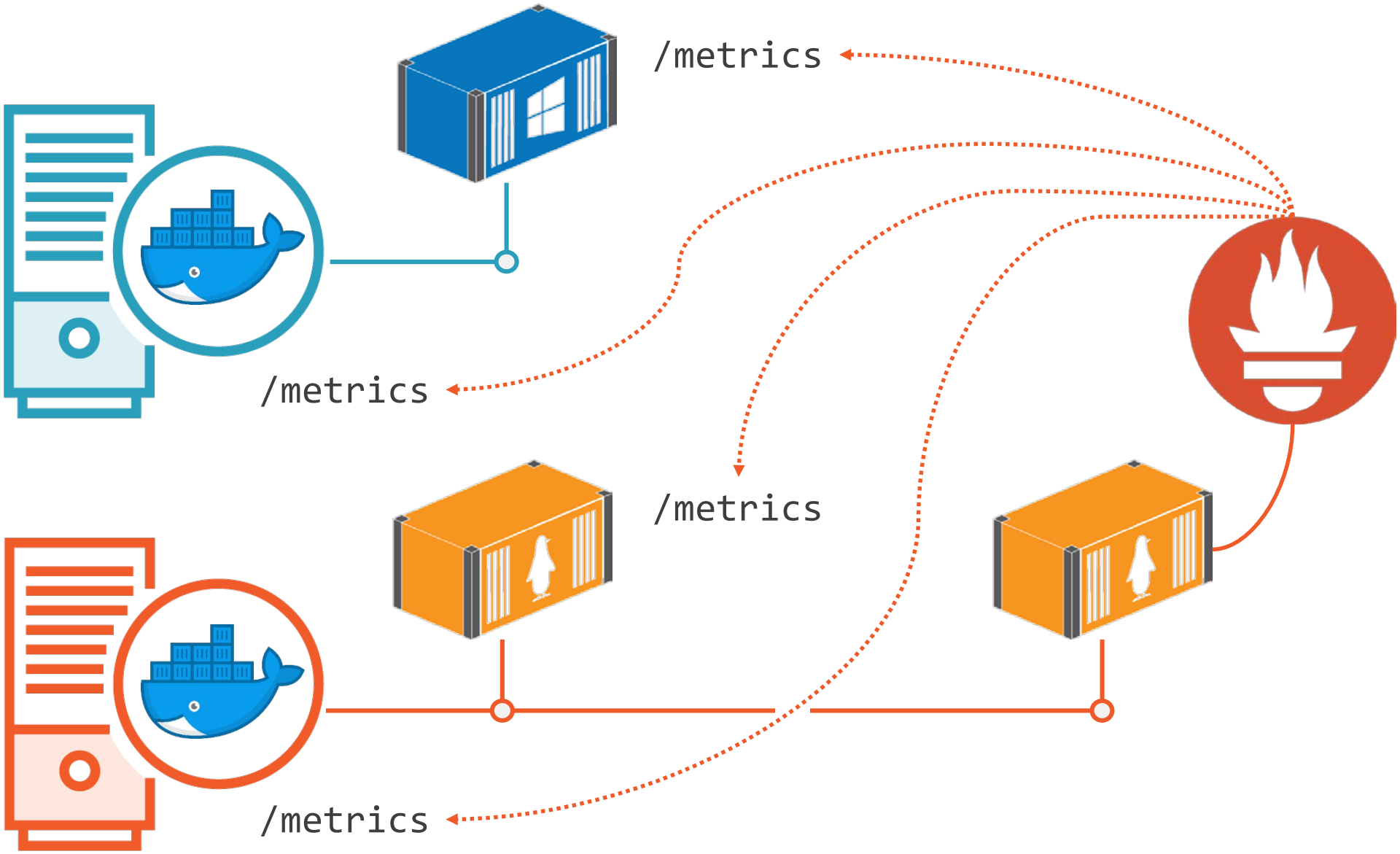


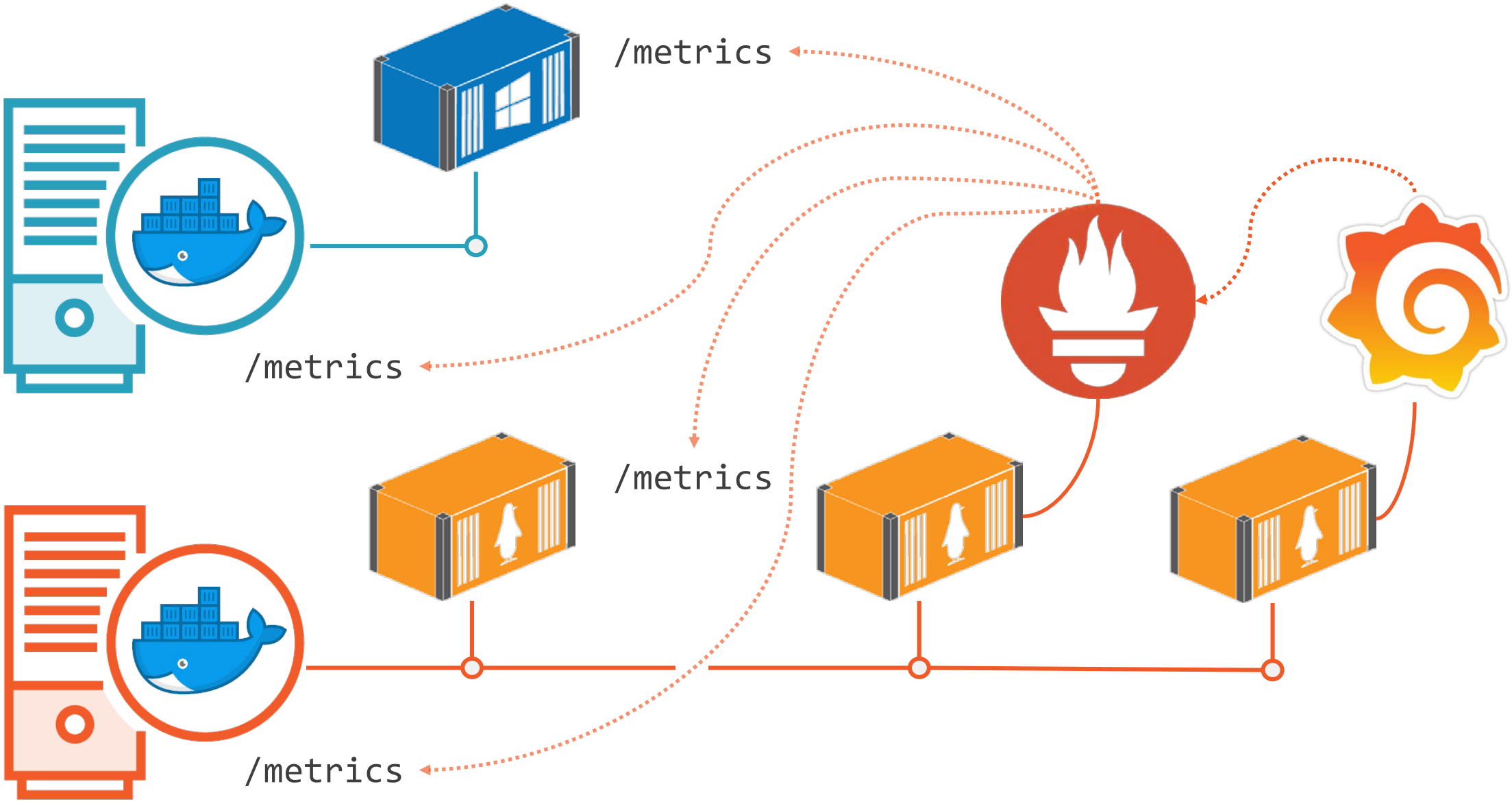
/metrics



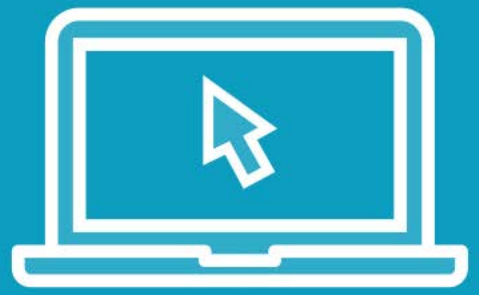
/metrics

```
# HELP engine_daemon_container_states_containers The count of containers
# TYPE engine_daemon_container_states_containers gauge
engine_daemon_container_states_containers{state="paused"} 0
engine_daemon_container_states_containers{state="running"} 23
engine_daemon_container_states_containers{state="stopped"} 9
# HELP engine_daemon_engine_cpus_cpus The number of CPUs
# TYPE engine_daemon_engine_cpus_cpus gauge
engine_daemon_engine_cpus_cpus 4
```


/metrics
/metrics
/metrics
/metrics

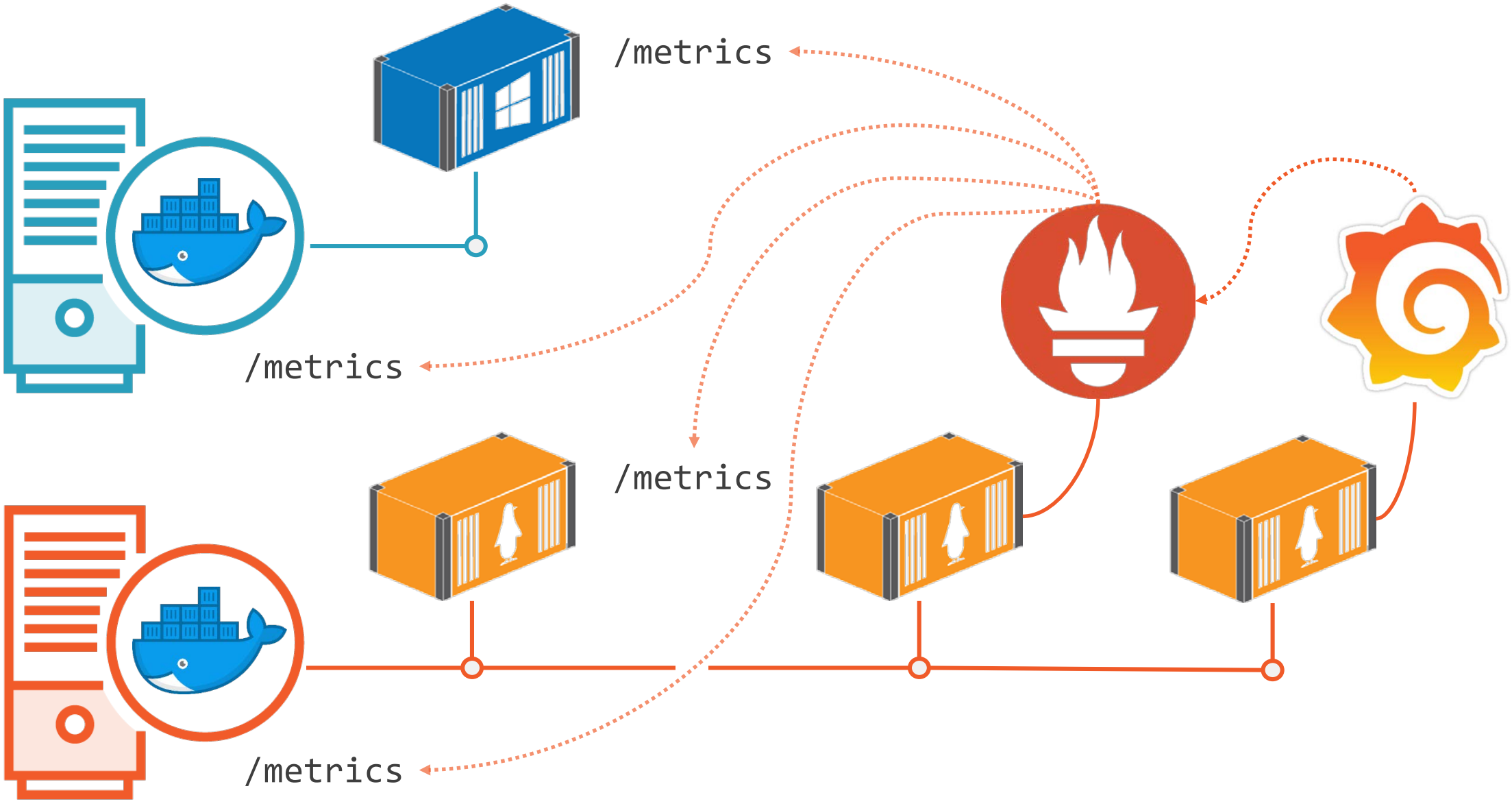

/metrics
/metrics
/metrics
/metrics

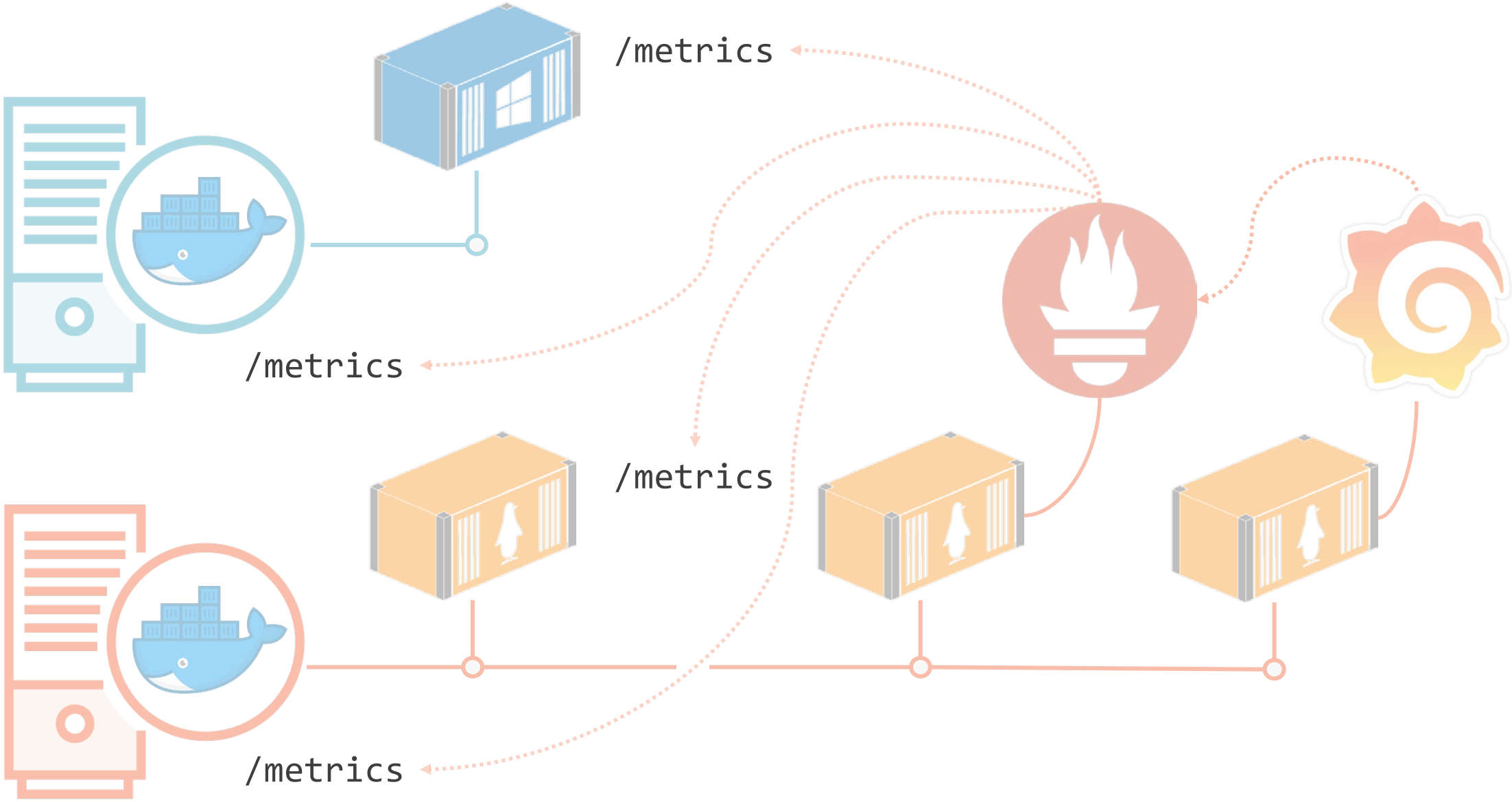
Demo

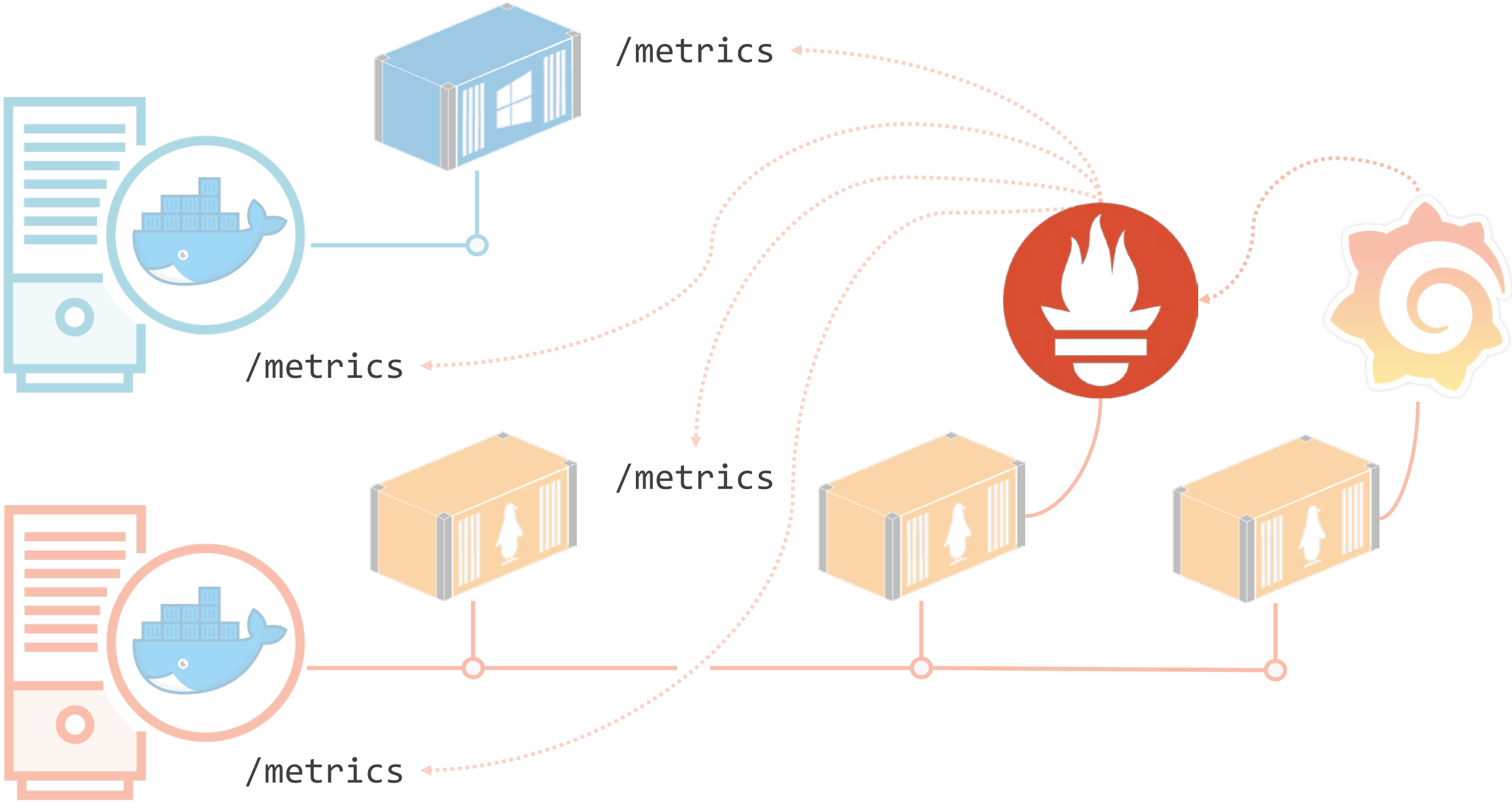


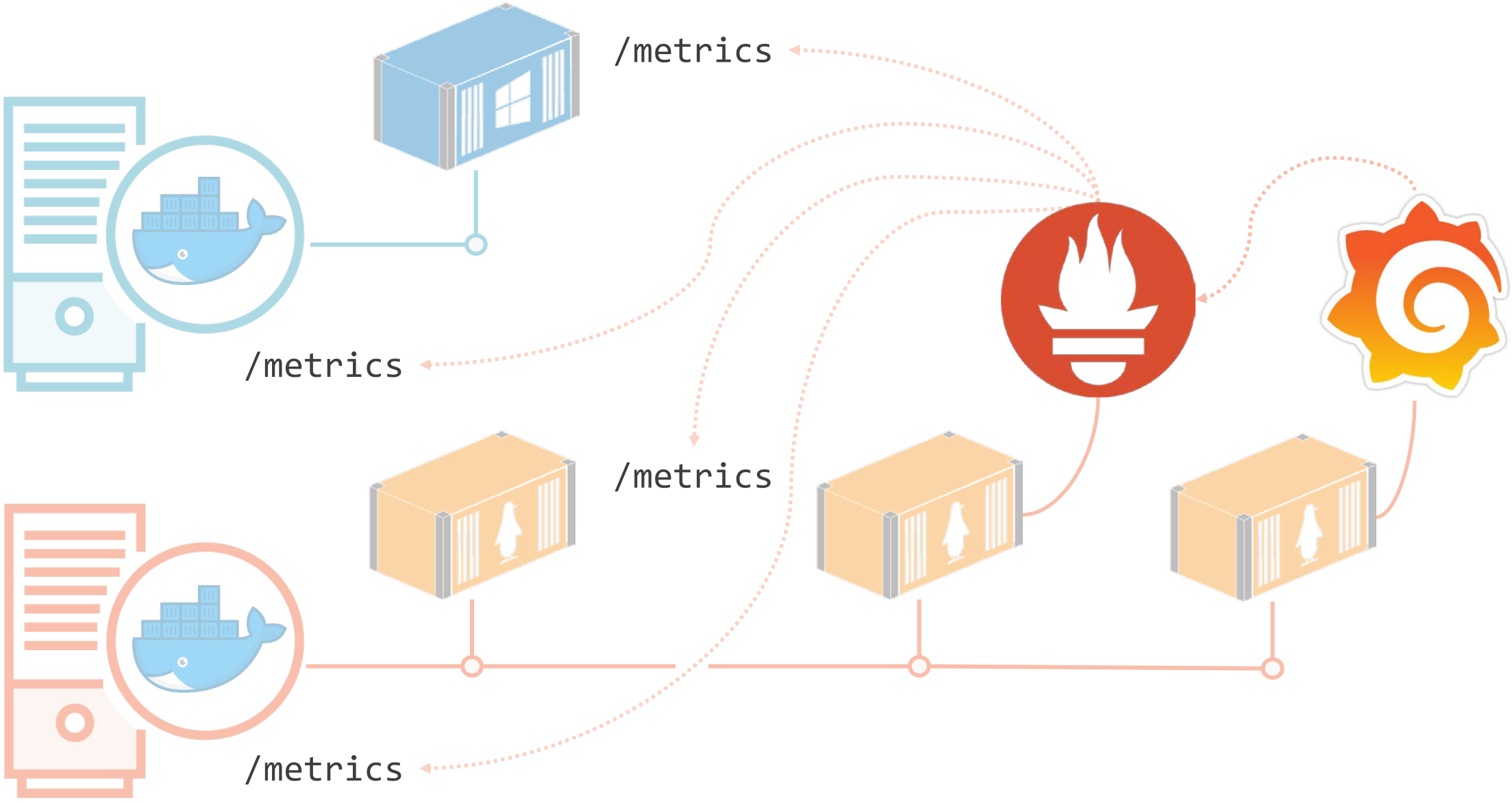
Monitoring Containerized Applications

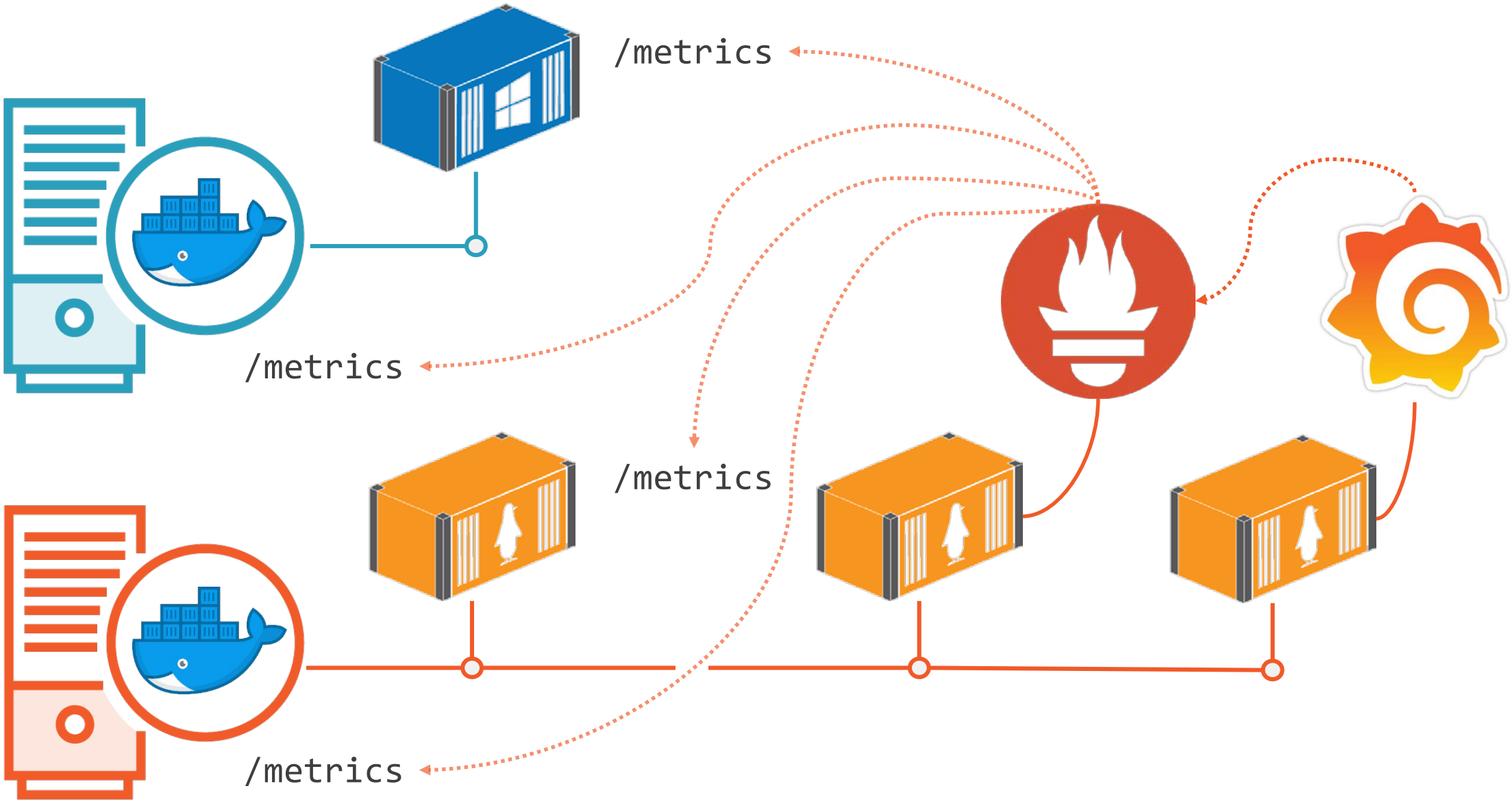
- Metrics from application containers
- Metrics from Docker
- Prometheus UI
- Grafana dashboard


/metrics
/metrics
/metrics
/metrics

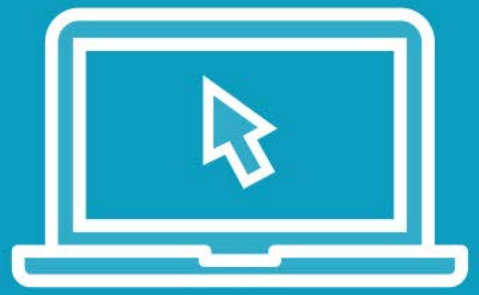

/metrics
/metrics
/metrics
/metrics


/metrics
/metrics
/metrics
/metrics


/metrics
/metrics
/metrics
/metrics

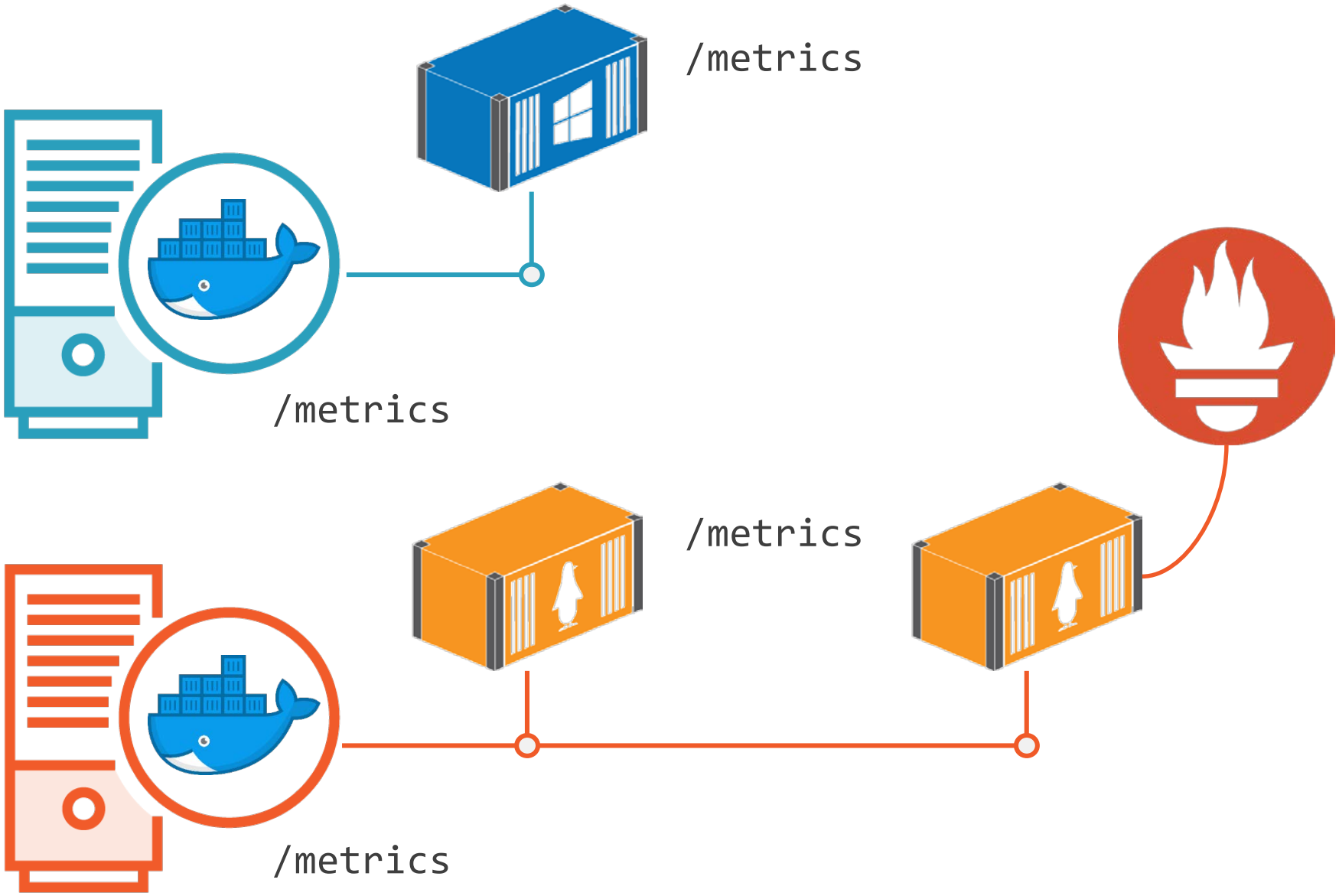

/metrics
/metrics
/metrics
/metrics

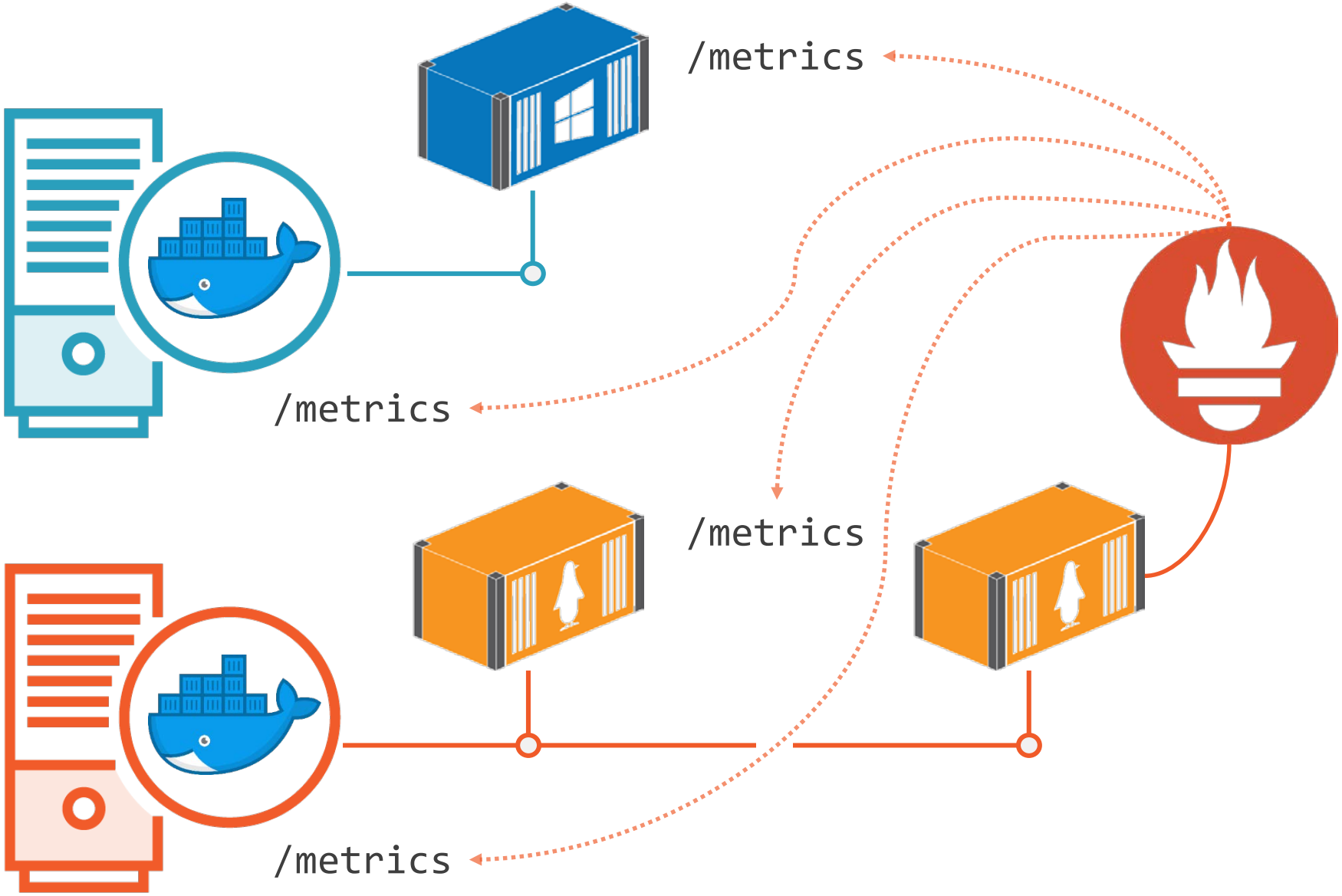
Demo

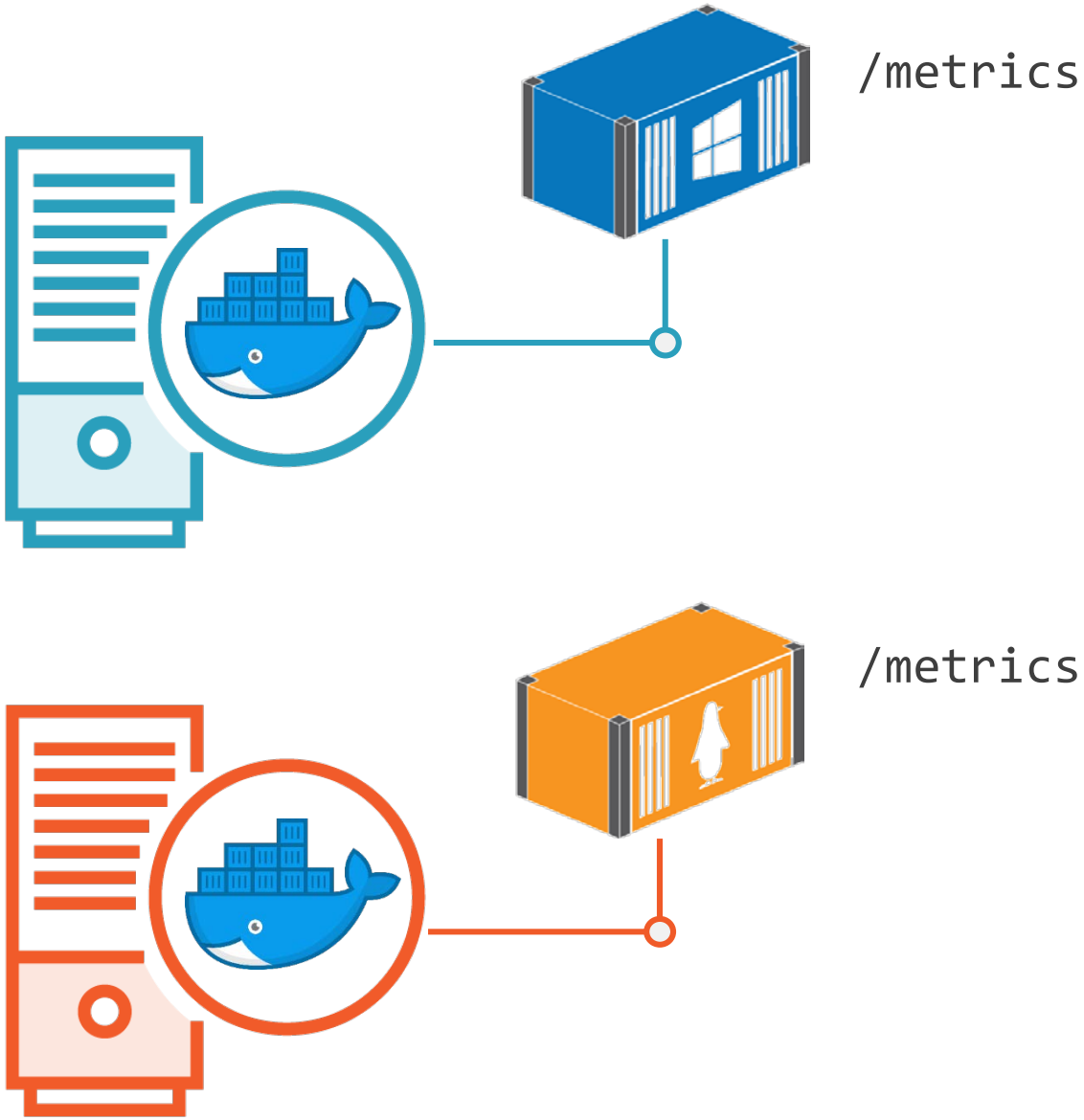


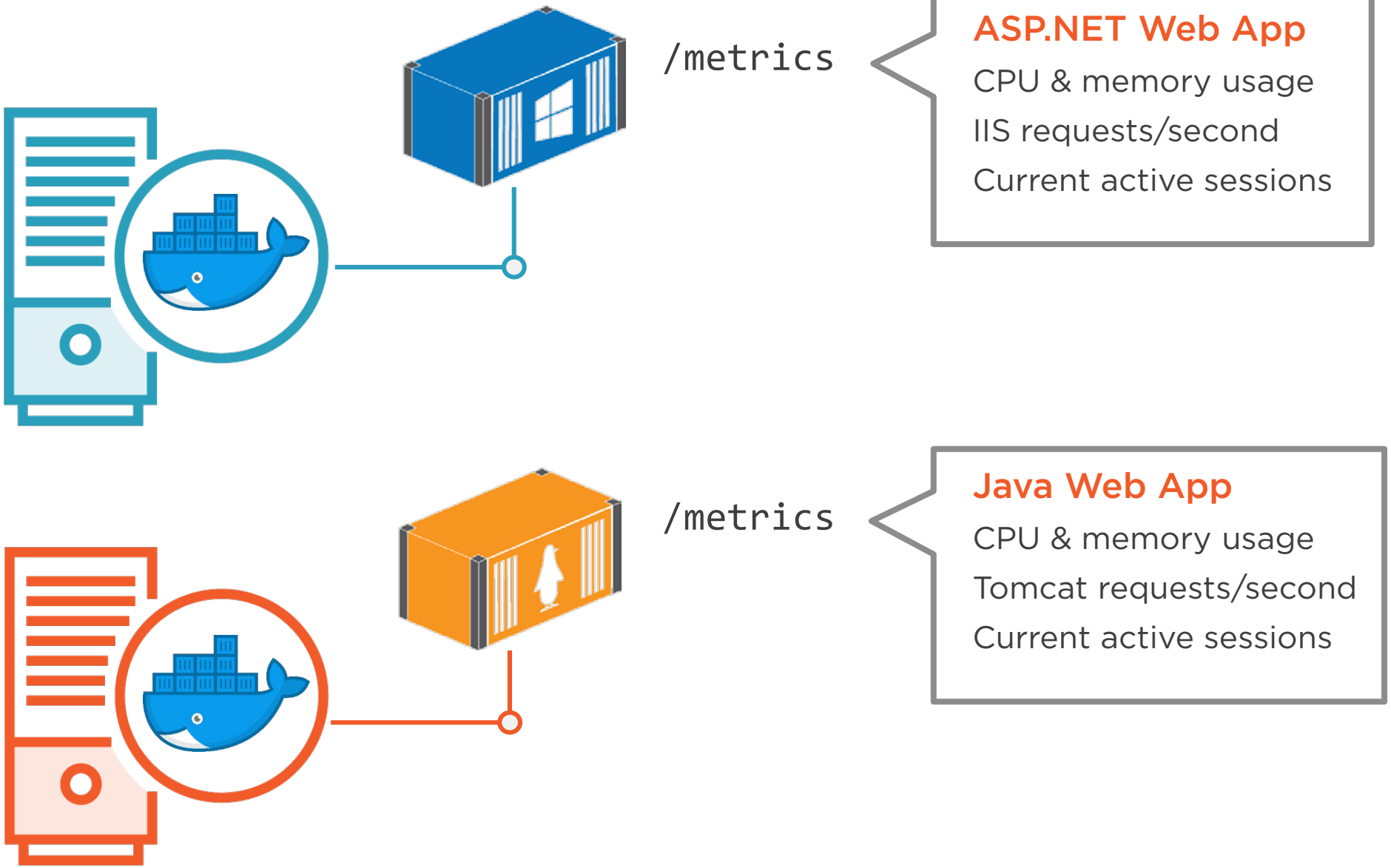
Monitoring with Prometheus

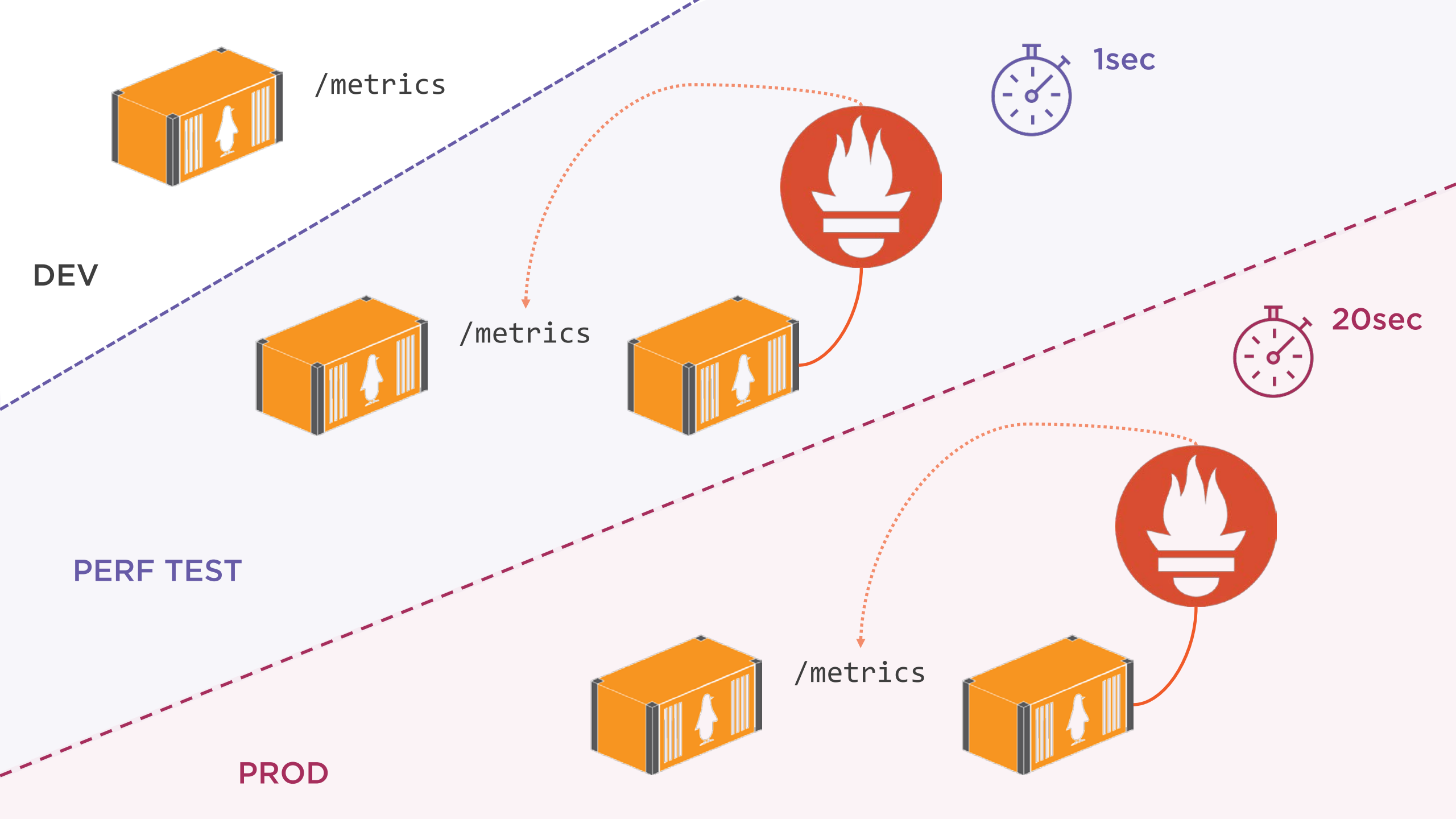
- Configuring metrics sources
- Using the Prometheus UI
- Querying metrics with PromQL

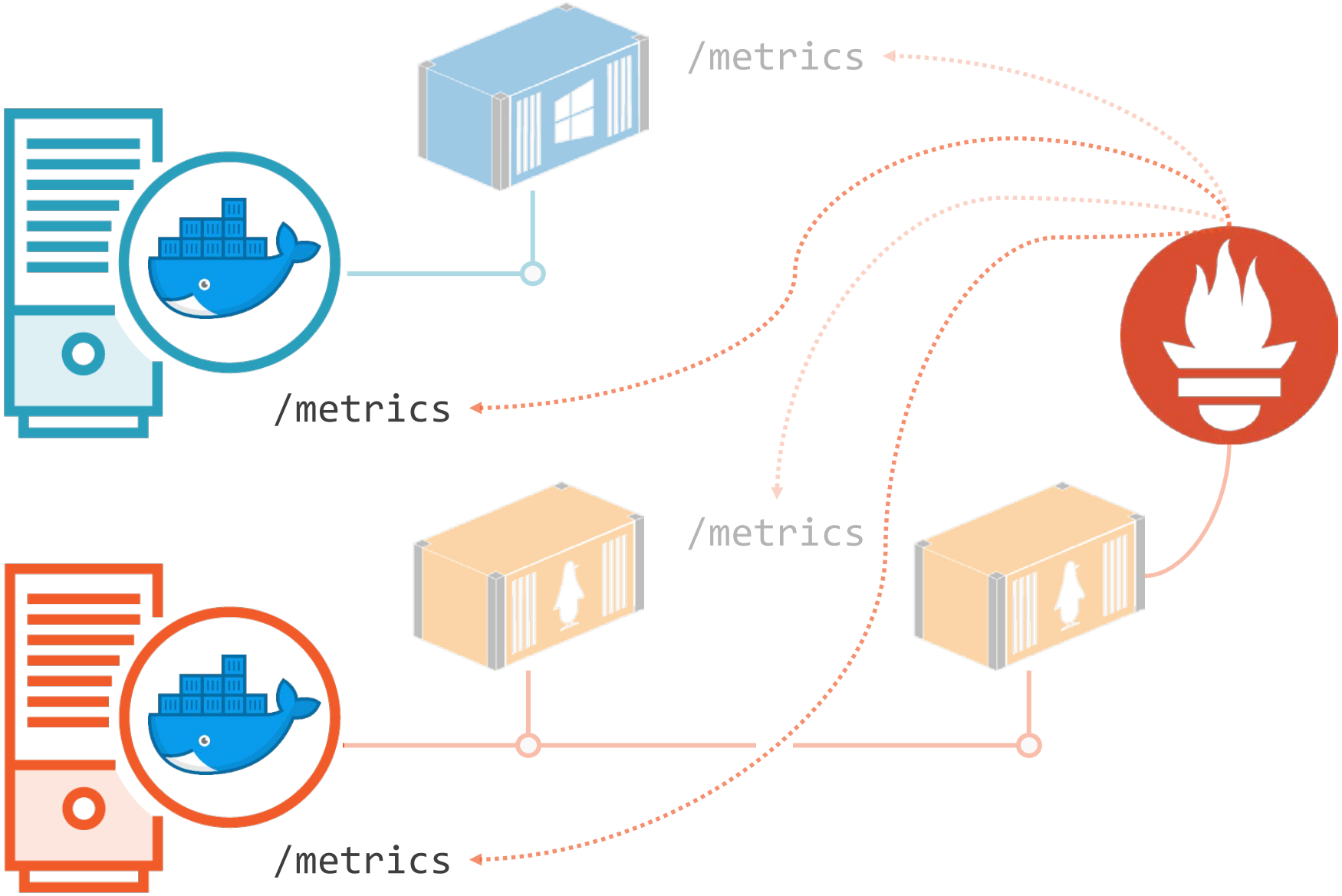

/metrics
/metrics
/metrics
/metrics


/metrics
/metrics
/metrics
/metrics

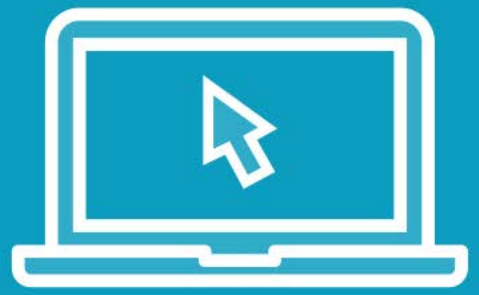

/metrics
/metrics


/metrics
ASP.NET Web App
CPU & memory usage
IIS requests/second
Current active sessions
/metrics
Java Web App
CPU & memory usage
Tomcat requests/second
Current active sessions


/metrics
1sec
DEV
/metrics
20sec
PERF TEST
/metrics
PROD

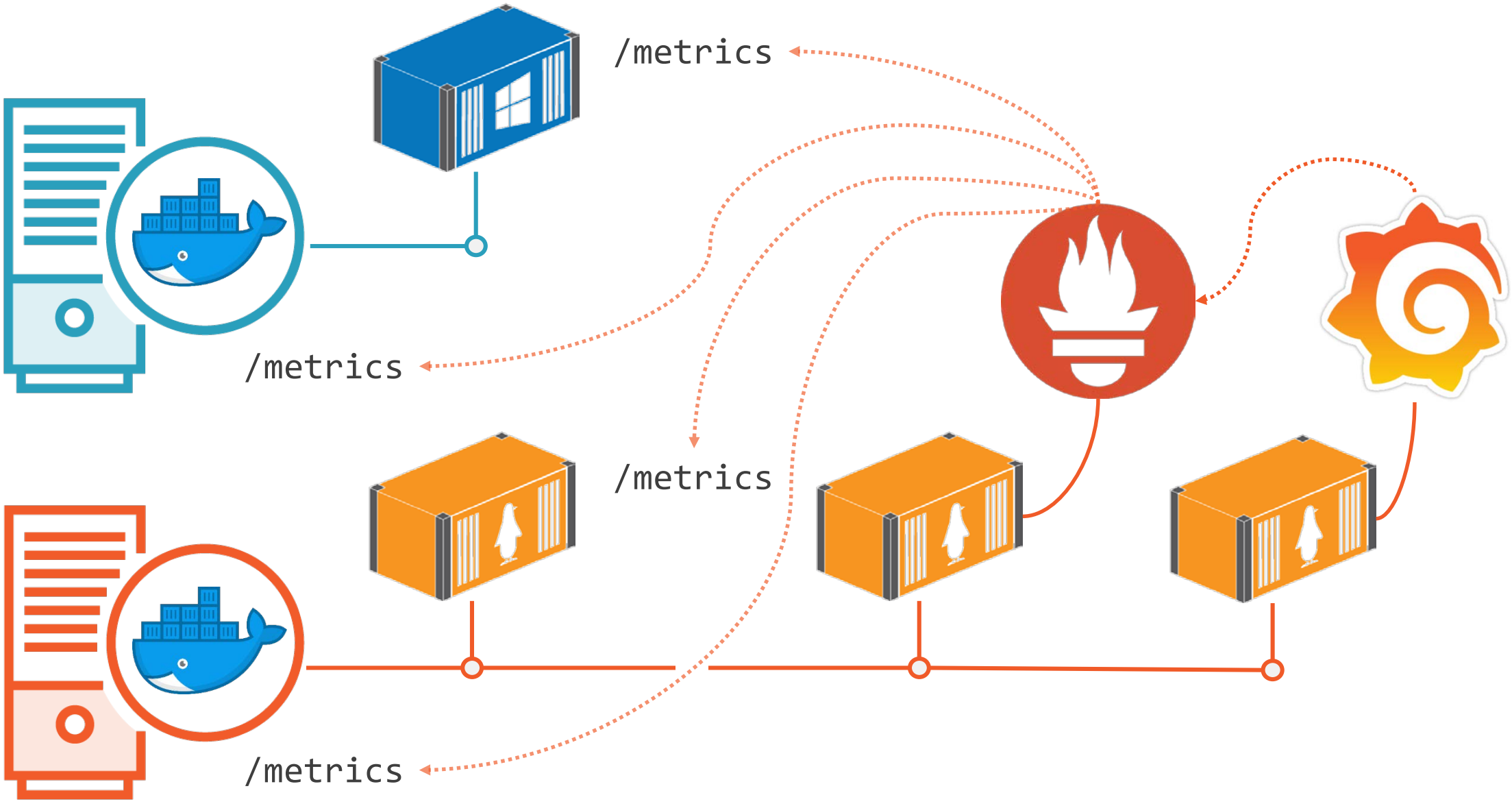

/metrics
/metrics
/metrics
/metrics

Demo



Docker Platform Metrics

- Container status
- Server metrics
- Swarm node status


/metrics
/metrics
/metrics
/metrics

Module Summary

Containerized App Monitoring

- Metrics endpoints in containers
- Metrics from the Docker platform
- Prometheus metrics server
- Grafana visualisation dashboard

Coming Next

Collecting Metrics with Prometheus

- Prometheus in Linux and Windows
- Configuring Prometheus
- Querying Prometheus metrics