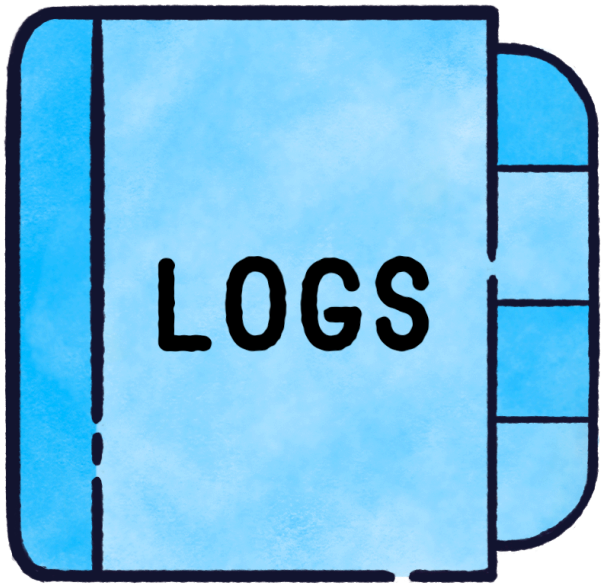
Utilize Container Logs

Elle Krout
Principal Course Author, Pluralsight

Logging in Kubernetes

Kubernetes Logging Basics



STDOUT and STDERR logged to container logs

Logging in Kubernetes is not persistent

- Logs kept through a single termination
- Evicted pod logs are not kept

Kubernetes logs are not centralized

Does not provide searching, filtering, or visualization

The CKAD covers only this basic logging

Kubernetes Container Logs

View Container Logs

```
> kubectl logs <pod_name>
```

```
10.244.1.1 - - [02/Jul/2025:12:00:01 +0000] "GET / HTTP/1.1" 200 1024 "-" "kube-probe/1.33" "-"
10.244.1.5 - - [02/Jul/2025:12:00:03 +0000] "GET /api/products HTTP/1.1" 200 4212 "-" "curl/
7.79.1" "-"
10.244.1.6 - - [02/Jul/2025:12:00:05 +0000] "POST /api/login HTTP/1.1" 401 512 "-" "Mozilla/
5.0" "-"
10.244.1.1 - - [02/Jul/2025:12:00:10 +0000] "GET / HTTP/1.1" 200 1024 "-" "kube-probe/1.33" "-"
10.244.1.7 - - [02/Jul/2025:12:00:12 +0000] "GET /api/users HTTP/1.1" 200 2048 "-"
"PostmanRuntime/7.29.0" "-"
10.244.1.8 - - [02/Jul/2025:12:00:15 +0000] "GET /nonexistent HTTP/1.1" 404 256 "-" "curl/
7.79.1" "-"
10.244.1.1 - - [02/Jul/2025:12:00:20 +0000] "GET / HTTP/1.1" 200 1024 "-" "kube-probe/1.33" "-"
10.244.1.6 - - [02/Jul/2025:12:00:25 +0000] "POST /api/orders HTTP/1.1" 500 1024 "-" "Mozilla/
5.0" "-"
10.244.1.3 - - [02/Jul/2025:12:00:30 +0000] "GET /metrics HTTP/1.1" 200 3000 "-" "Prometheus/
2.48.1" "-"
```

View Container Logs (Specific Container)

```
> kubectl logs <pod_name> -c <container_name>

10.244.1.1 - - [02/Jul/2025:12:00:01 +0000] "GET / HTTP/1.1" 200 1024 "-" "kube-
probe/1.33" "-"
10.244.1.5 - - [02/Jul/2025:12:00:03 +0000] "GET /api/products HTTP/1.1" 200 4212
"-" "curl/7.79.1" "-"


> kubectl get pod <pod-name> -o jsonpath='{.spec.containers[*].name}'

container1 container2 container3
```

View Container Logs (Deployment)

```
> kubectl logs deployment/<deployment_name>

[2025-07-02T12:01:12.123] INFO  Starting web server on port 3000
[2025-07-02T12:01:12.456] INFO  Connected to MongoDB at mongodb://db:27017/app
[2025-07-02T12:01:13.001] INFO  Listening for requests at http://0.0.0.0:3000/
[2025-07-02T12:01:15.329] INFO  GET /api/users 200 - 12.5 ms
[2025-07-02T12:01:16.789] INFO  POST /api/login 200 - 9.3 ms
[2025-07-02T12:01:20.556] WARN  Invalid JWT token in request to /api/profile
[2025-07-02T12:01:21.872] ERROR Failed to fetch user profile: MongoError:
authentication failed
[2025-07-02T12:01:22.104] INFO  GET /healthz 200 - 2.1 ms
[2025-07-02T12:01:25.999] INFO  POST /api/logout 204 - 3.0 ms
[2025-07-02T12:01:30.011] INFO  Shutting down gracefully
```

View Container Logs Based on Label

```
> kubectl logs -l app=task-app --all-containers

I0714 15:36:53.011242       1 config.go:105] "Starting endpoint slice config
controller"
I0714 15:36:53.011271       1 shared_informer.go:350] "Waiting for caches to sync"
controller="endpoint slice config"
I0714 15:36:53.041511       1 config.go:440] "Starting serviceCIDR config
controller"
I0714 15:36:53.041550       1 shared_informer.go:350] "Waiting for caches to sync"
controller="serviceCIDR config"
I0714 15:36:53.043839       1 config.go:329] "Starting node config controller"
I0714 15:36:53.043861       1 shared_informer.go:350] "Waiting for caches to sync"
controller="node config"
I0714 15:36:53.111619       1 shared_informer.go:357] "Caches are synced"
controller="endpoint slice config"
```

Follow Container Logs

```
> kubectl logs -f <pod-name>

2025-07-02T12:00:01.123 [INFO] Starting Task API server on port 3000
2025-07-02T12:00:01.456 [INFO] Connected to PostgreSQL at task-db:5432
2025-07-02T12:00:02.001 [INFO] GET /tasks 200 - 10ms
2025-07-02T12:00:03.789 [WARN] POST /tasks failed validation: missing title
2025-07-02T12:00:05.456 [INFO] GET /healthz 200 - 2ms
2025-07-02T12:00:07.123 [ERROR] PUT /tasks/1234 - DB write failed: timeout
2025-07-02T12:00:09.456 [INFO] DELETE /tasks/1234 204 - 5ms
```

View Last Container Logs

```
> kubectl logs --tail=3 <pod_name>

[2025-07-02 12:00:01] [FORWARD] Sending logs to fluentd at 10.244.0.10:24224
[2025-07-02 12:00:05] [FORWARD] 6 log entries forwarded
[2025-07-02 12:00:10] [FORWARD] 7 log entries forwarded
```

View Container Logs Based on Time

```
> kubectl logs --since=10m <pod_name>

2025-07-02T12:00:01.123 [INFO] Starting Task API server on port 3000
2025-07-02T12:00:01.456 [INFO] Connected to PostgreSQL at task-db:5432
2025-07-02T12:00:02.001 [INFO] GET /tasks 200 - 10ms
2025-07-02T12:00:03.789 [WARN] POST /tasks failed validation: missing title
2025-07-02T12:00:05.456 [INFO] GET /healthz 200 - 2ms
2025-07-02T12:00:07.123 [ERROR] PUT /tasks/1234 - DB write failed: timeout
2025-07-02T12:00:09.456 [INFO] DELETE /tasks/1234 204 - 5ms
```

View Terminated Container Logs

```
> kubectl logs -p <pod_name>
```

```
2025-07-02T12:00:00.001 [INFO] Starting Task API server on port 3000
2025-07-02T12:00:00.124 [INFO] Connecting to database at task-db:5432
2025-07-02T12:00:05.451 [ERROR] Database connection failed: timeout
2025-07-02T12:00:05.452 [INFO] Retrying in 5 seconds...
2025-07-02T12:00:10.899 [ERROR] Database connection failed: timeout
2025-07-02T12:00:10.900 [FATAL] Max retries reached. Exiting.
```

Demo: Working with Kubernetes Container Logs

Exam Scenario

Deploy the application found in the `node-app.yaml` file

Ensure the pod deployed without error – if there is an error, track down which container is the source of the error and view its container logs

View the logs for any previous deployment of that container

Resolve the issue and redeploy the pods

View the container logs for the pod to confirm the application is working