

KUBERNETES FROM ZERO · FOUNDATIONS 11 OF 12 · LESSON 11 · LESSON KIT · CHEAT SHEET

Kubernetes from Zero, part 11: requests, limits and QoS classes

Requests, limits, the three QoS classes, and the commands from Lesson 11.

Ran every example on kind v0.33.0, node v1.37.0, kubectl v1.37.2, cgroup v2 node, 10 Nov 2026. Cluster: k8s-ep10.

THE ONE RULE

Set requests so the scheduler can place you, set a memory limit you can live with, and remember that CPU over the limit slows down while memory over the limit gets killed.

What the numbers mean

the scheduler counts requests; the kernel enforces limits

WORD	WHAT THE LESSON SAYS	WHERE YOU READ IT
requests	What the scheduler reserves. Usage graphs will not explain a Pending Pod, because the scheduler counts requests.	`resources.requests`
limits	What the kernel enforces through cgroups.	`resources.limits`
cpu: 500m	Half a core. `1` is one core or vCPU.	a CPU quantity
memory: 64Mi	64 mebibytes. `64m` would be millibytes.	a memory quantity
CPU at the limit	The container is throttled and keeps running. Read `nr_throttled` and `throttled_usec`.	`/sys/fs/cgroup/cpu.stat`
Memory at the limit	The container is OOM-killed. Exit code 137.	`Reason: OOMKilled`
Guaranteed	Requests equal limits for cpu and memory, every container. Limits alone are copied to requests.	evicted last
BestEffort	No requests and no limits.	evicted first
Burstable	Anything in between.	between the other two

Key commands

commands verbatim from the lesson

Look

`kubectl describe node k8s-ep10-control-plane`
Allocatable and Allocated resources. The lesson's node has 8 CPUs and about 16 GiB.

`kubectl get pod <name> -o jsonpath='{.status.qosClass}'`
Guaranteed, Burstable or BestEffort

`kubectl exec <pod> -- cat /sys/fs/cgroup/cpu.stat`
nr_throttled and throttled_usec

`kubectl describe pod <name>`
OOMKilled and exit 137, or FailedScheduling

`kubectl describe resourcequota`
the namespace budget

`kubectl describe replicaset -l app=<name>`
quota errors show up here, not on the Deployment

SCAN FOR THE LESSON

Lesson: **Kubernetes from Zero, part 11: requests, limits and QoS classes**

https://aitamer.news/posts/k8s-from-zero-11-requests-limits-and-qos/?utm_source=lessonkit&utm_medium=pdf&utm_campaign=k8s-11&utm_content=cheatsheet

NEXT IN THE SERIES **Next: Lesson 12, the first checkpoint lab**. The first checkpoint lab, where you build a two-tier app with everything from parts 1 to 11 and grade it with a script. Lesson page

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