DevOpsSchool

Course curriculum · November 2026

ADVANCED LEVEL

Kubernetes Advance Networking

Design external load balancing for cloud and bare metal clusters and write your own CNI plugin from the reference skeleton.

LIVE ONLINE Max 8-10 hours	**CORPORATE (DAY-WISE)** 5 days · Days 1-5	**SELF-PACED VIDEO** 1-year LMS access
BATCH SIZE Max 10 learners	**NEXT BATCHES** 1st of every month · weekends: first Saturday	**CERTIFICATE** Verifiable certificate of completion

Advanced
5 days · This curriculum

INSIDE THIS CURRICULUM

What you will achieve	Outcomes and level focus
Who should attend	Audience and prerequisites
Agenda	51 topics · Foundation to Advanced
Hands-on labs	4 labs
Formats and fees	Live, 1:1, self-paced, corporate
Trainer and reviews	Rajesh Kumar
Enrolment	Batches, payment, contacts

WHY DEVOPSSCHOOL

- Rated 4.6 on Google
- 1,500+ verifiable certificates issued in the public registry
- Trainer Rajesh Kumar: 20 years in industry
- Small batches: max 10 learners, every session recorded

Course page: www.devopsschool.com/courses/kubernetes/kubernetes-advanced-networking-course.html
Talk to us: WhatsApp +91 99057 40781 · +1 (469) 756-6329 · contact@DevOpsSchool.com · reply within 1 hour

OUTCOMES

What you will achieve

By the end of the Kubernetes Networking course path, you will be able to:

1

Understand the network model

Explain pod, Service and external traffic paths down to namespaces, veth pairs, bridges and routes.

2

Operate CNI and policies

Install, configure and troubleshoot Calico and Flannel and enforce traffic rules with NetworkPolicies.

3

Engineer load balancing

Design external access with LoadBalancer Services, Ingress, HAProxy and Keepalived, and extend networking with custom CNI plugins.

WHAT THE ADVANCED LEVEL ADDS

Load balancing, HAProxy and custom CNI plugins

Hands-on: Build HA ingress and a CNI plugin. Run HAProxy with a Keepalived VIP in front of NodePort Services on a bare metal cluster, then build and install a minimal bridge-style CNI plugin from the skeleton.

WHO SHOULD ATTEND

- Experienced Kubernetes Networking practitioners responsible for quality, security and scale.
- Senior engineers, architects and leads who design and troubleshoot Kubernetes Networking solutions.
- Teams making Kubernetes Networking an organisation-wide standard.

BEFORE YOU START

- Kubernetes Networking experience at Intermediate level (covered in the earlier days of this curriculum).
- Basic computer skills and a laptop with a stable internet connection for the live sessions and labs.
- This curriculum includes every earlier level, so it is complete on its own.

AGENDA · FOUNDATION TO ADVANCED

Kubernetes Advance Networking agenda

51 topics. Each level builds on the one before it, so this curriculum lists every earlier level in full. Days are for corporate (day-wise) delivery; live online batches cover the same agenda in max 8-10 hours.

DAY 1 — Foundation: Kubernetes network model and Linux networking basics

Included from Foundation

1. Understanding the Kubernetes networking model: one IP per pod, flat network, no NAT between pods and nodes
2. Intra-pod communication: containers sharing one network namespace and talking over localhost
3. Inter-pod communication: pod to pod on the same node and across nodes through routes or overlays
4. Pod to Service communication: ClusterIP virtual IPs and kube-proxy in iptables, IPVS and nftables modes
5. External access: NodePort, LoadBalancer and Ingress entry points at a glance
6. Kubernetes networking versus Docker networking: bridge, host and port mapping compared with the pod model
7. Basic Linux networking: IP addresses and ports, interfaces and the ip command
8. Network namespaces: ip netns, how each pod gets its own stack and the pause container
9. Virtual Ethernet devices and bridges: veth pairs, cni0 and docker0 style bridges
10. Routing and maximum transmission unit: ip route, MTU, encapsulation overhead and fragmentation
11. Pod networking: podCIDR per node, pod IP allocation and how the kubelet invokes networking
12. Inspection toolkit: kubectl exec, nsenter, ss, tcpdump and crictl for tracing pod traffic

DAY 2 — Essential: Service discovery, ingress and CNI fundamentals

Included from Essential

13. Lookup and discovery: CoreDNS service and pod records, environment variables and search domains
14. Self-registration: client-side registries versus Kubernetes Services as the built-in registry
15. Services and endpoints: selectors, Endpoints and EndpointSlices, headless Services for direct pod addressing
16. Loosely coupled connectivity with queues: decoupling producers and consumers through a message broker
17. Loosely coupled connectivity with data stores: shared databases and caches as integration points
18. Kubernetes Ingress: Ingress resources, host and path rules, TLS secrets and Ingress controllers
19. Kubernetes network plugins: kubenet versus Container Network Interface plugins
20. Kubenet: requirements, setting the MTU and reliance on cloud provider routes
21. Container Network Interface: container runtime, CNI plugin binaries, /etc/cni/net.d config and IPAM
22. Kubernetes networking solutions: bridging on bare metal clusters and Open vSwitch
23. Further solutions: Contiv, Nuage Networks VCS, Romana and Canal (Flannel plus Calico policy), with current status
24. Choosing a CNI today: Calico, Cilium, Flannel and cloud VPC CNIs compared on policy, performance and operations

DAY 3 — Intermediate: Calico, Flannel and network policy in depth

Included from Intermediate

25. Kubernetes networking with Project Calico: Felix, BIRD, Typha, IPAM and BGP versus VXLAN or IP-in-IP modes
26. Quickstart for Calico on Kubernetes: installing with the Tigera operator and checking calico-node status
27. Install and configure calicoctl: IP pools, node status, BGP peers and Calico-specific policies
28. NetworkPolicy API: secure a simple application with pod and namespace selectors
29. Ingress and egress control: restrict incoming and outgoing traffic with the NetworkPolicy API

30. Policy visualisation: a user interface that shows blocked and allowed connections in real time
31. Project Calico troubleshooting: calico-node logs, route tables, BGP state and policy hit counters
32. Kubernetes networking with Project Flannel: how it works, flanneld, subnet leases and the kube-flannel DaemonSet
33. Flannel setup: getting started on Kubernetes, deploying manually, building and configuration (net-conf.json)
34. Flannel backends and running: VXLAN, host-gw and WireGuard; Flannel troubleshooting and projects integrating with it
35. Understanding the Kubernetes network policy design: podSelector, namespaceSelector, ipBlock and policyTypes
36. Network policies and CNI plugins: which plugins enforce policy and what happens when none does
37. Using network policies effectively: configuring and implementing default deny, allow lists and DNS egress rules

DAYS 4-5 **Advanced: Load balancing, HAProxy and custom CNI plugins** — New at this level

38. Load balancing operations: Service type LoadBalancer, cloud controllers and the request path to pods
39. External load balancer configuration: via a configuration file and via kubectl expose
40. Load balancer addressing: finding its IP addresses and identifying client IPs with externalTrafficPolicy
41. Annotating the load balancer: provider annotations for health checks, internal balancers and TLS
42. Understanding potential uneven external load balancing: Local versus Cluster traffic policy and pod spread
43. Service load balancer versus Ingress: when to use L4 Services, Ingress controllers or the Gateway API
44. HAProxy: a custom load balancer provider utilizing the NodePort
45. HAProxy in-cluster: running it inside Kubernetes as an Ingress or TCP load balancer
46. Keepalived VIP: highly available bare metal entry points, compared with MetalLB
47. Writing your own CNI plugin: CNI specification, ADD, DEL and CHECK commands and result formats
48. Loopback plugin: a first look at the simplest plugin and how the runtime calls it
49. Building on the CNI plugin skeleton: the Go skel package, IPAM delegation and error handling
50. Reviewing the bridge plugin: bridge creation, veth setup, host-local IPAM and IP masquerade
51. Capstone: design the network for a multi-tenant cluster with policies, ingress and HA load balancing

PRACTICE

Hands-on labs

You build these yourself during the course, guided by the trainer.

FOUNDATION **Trace a packet between two pods**

Create two pods on different nodes, find their network namespaces and veth pairs, and capture the traffic with tcpdump as it crosses the bridge and node routes.

ESSENTIAL **Expose services through DNS and Ingress**

Deploy a frontend, an API and a queue consumer, verify discovery through CoreDNS and headless Services, and route external traffic to them with an Ingress controller.

INTERMEDIATE **Lock down an app with NetworkPolicies**

Install Calico, apply default-deny and least-privilege ingress and egress policies to a three-tier app and watch blocked and allowed connections live; repeat the setup on Flannel and compare.

ADVANCED

Build HA ingress and a CNI plugin

Run HAProxy with a Keepalived VIP in front of NodePort Services on a bare metal cluster, then build and install a minimal bridge-style CNI plugin from the skeleton.

HOW YOU CAN LEARN

Formats and fees

The same agenda in four formats. Fees are in Indian rupees as of November 2026; the course page shows them in your currency.

FORMAT	DURATION	WHAT YOU GET	FEE
Live & interactive (online)	Max 8-10 hours	Instructor-led public batch of max 10 learners with demos, labs, Q&A and assignment review. Weekday batches start on the 1st of every month, weekend batches on the first Saturday of every month.	**INR 34,999**
1:1 live training (online)	Max 8-10 hours, one-to-one	The same agenda, taught one-to-one by the trainer. Starts immediately, without waiting for the next batch; sessions planned around your working hours, at your pace.	**INR 99,999**
Self-paced video	1-year LMS access	Every available Kubernetes Networking level, plus 20+ more courses and 50+ tools, at your own pace.	**INR 833/month** billed yearly at INR 9,996
Corporate (day-wise)	5 days for this level	A private batch for your team, on demand. Foundation 1 day, Essential 2, Intermediate 3, Advanced 5 (cumulative).	**Quote on request**

ASSESSMENT AND CERTIFICATE

Your progress is checked through hands-on labs and assignments at every level. On completion you receive a DevOpsSchool certificate of completion with a unique credential ID that anyone can verify at devopsschool.com/certificates.

INCLUDED WITH EVERY LIVE BATCH

- Every live session is recorded and stays in your LMS for a year.
- Can't attend your batch? Move to next month's batch.
- Free demo class before you pay.
- Free 10-15 minute call with an advisor or the trainer to check the course fits you.

YOUR TRAINER

Learn from Rajesh Kumar

Principal Architect, trainer and mentor in DevOps, SRE, DevSecOps and platform engineering, with 20 years across 8+ software MNCs, including Staff DevOps/SRE Engineer for a leading Japanese mobile-payment platform and Principal DevOps Architect and Manager in Europe.

Profile: www.rajeshkumar.xyz · Videos: youtube.com/@TheDevOpsSchool

20 years in industry	**200+** corporate trainings
10,000+ engineers mentored	**70+** organisations coached

REVIEWS

What learners say

Rated 4.6 on Google · more reviews at devopsschool.com/testimonials and in our video testimonials.

> “Rajesh is very good trainer. Rajesh was able to resolve our queries and question effectively. We really liked the hands-on examples covered during this training program.”
>
> Indrayani, India

> “The training was very useful and interactive. Rajesh helped develop the confidence of all.”
>
> Abhinav Gupta, Pune

START YOUR KUBERNETES NETWORKING TRAINING

Join the next batch

Weekday batches start on the 1st of every month and weekend batches on the first Saturday of every month, with max 10 learners each. 1:1 training can start immediately; corporate batches run on demand. We reply within 1 hour.

Pay by UPI, credit and debit cards, net banking or PayPal. Before you pay, read our refund policy. All levels of this course: www.devopsschool.com/courses/kubernetes/

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