

?????????? K8s

- [Install kubeadm #1](#)
- [Install kubeadm #2](#)
- [Install kubectl](#)

?????????? Kubernetes ?????????? kubeadm (4 ??, Ubuntu 24.04)

Hypervisor	VM/Node	Role	IP
srv-01	vm-01	control-plane	192.168.1.10
srv-01	vm-02	worker	192.168.1.11
srv-02	vm-03	worker	192.168.1.12
srv-02	vm-04	worker	192.168.1.13

Требуется полная сетевая связность между хостами-гипервизорами.

?????????? ??

Уникальные hostname / MAC / product_uuid

```
sudo hostnamectl set-hostname vm-01      # своё имя на каждой ноде
ip link                                  # проверка MAC
sudo cat /sys/class/dmi/id/product_uuid   # проверка uuid
```

Прописать `/etc/hosts` со всеми 4 IP+именами (или настроить DNS).

Отключение swap

```
sudo swapoff -a
sudo sed -i ' / swap / s/^/#/' /etc/fstab
```

Включение Модулей ядра и sysctl

```
cat <<EOF | sudo tee /etc/modules-load.d/k8s.conf
overlay
```

```
br_netfilter
EOF
sudo modprobe overlay
sudo modprobe br_netfilter

cat <<EOF | sudo tee /etc/sysctl.d/k8s.conf
net.bridge.bridge-nf-call-iptables = 1
net.bridge.bridge-nf-call-ip6tables = 1
net.ipv4.ip_forward = 1
EOF
sudo sysctl --system
```

Диапазоны открытых портов:

Control-plane: 6443, 2379-2380, 10250, 10259, 10257

Workers: 10250, 30000-32767

???????? containerd (all nodes)

```
sudo apt-get update
sudo apt-get install -y containerd

sudo mkdir -p /etc/containerd
containerd config default | sudo tee /etc/containerd/config.toml
sudo sed -i 's/SystemdCgroup = false/SystemdCgroup = true/' /etc/containerd/config.toml
sudo systemctl restart containerd
sudo systemctl enable containerd
```

???????? kubeadm, kubelet, kubectl (all nodes)

```
sudo apt-get install -y apt-transport-https ca-certificates curl gpg

curl -fsSL https://pkgs.k8s.io/core:/stable:/v1.34/deb/Release.key | \
  sudo gpg --dearmor -o /etc/apt/keyrings/kubernetes-apt-keyring.gpg

echo 'deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg]
https://pkgs.k8s.io/core:/stable:/v1.34/deb/ /' | \
  sudo tee /etc/apt/sources.list.d/kubernetes.list

sudo apt-get update
sudo apt-get install -y kubelet kubeadm kubectl
```

```
sudo apt-mark hold kubelet kubeadm kubectl
```

Замените `v1.34` на актуальную минорную версию ([Kubernetes Releases](#))

???????????? control-plane (vm-01)

```
sudo kubeadm init \
  --apiserver-advertise-address=192.168.1.10 \
  --pod-network-cidr=10.244.0.0/16
```

Сохраните `token` из команды `kubeadm join ...`

Повторная генерация: `kubeadm token create --print-join-command`

????????? kubectl (vm-01)

```
mkdir -p $HOME/.kube
sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
sudo chown $(id -u):$(id -g) $HOME/.kube/config
```

????????? ?????? CNI (vm-01)

```
kubectl apply -f https://github.com/flannel-io/flannel/releases/latest/download/kube-
flannel.yml
```

`kubectl get nodes` — control-plane должна перейти в `Ready`

???????????? workers (vm-02, vm-03, vm-04)

```
sudo kubeadm join 192.168.1.10:6443 --token <token> \
  --discovery-token-ca-cert-hash sha256:<hash>
```

????????? ?????????? (vm-01)

```
kubectl get nodes -o wide
kubectl get pods -A
```

Успешный результат

All NODEs — `Ready`

System PODs (coredns, kube-proxy, CNI) — `Running`

Для управления с другой машины скопируйте `~/.kube/config` с `vm-01`

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