

????????? virsh?libvirt

??

??

?? Linux ?????????????? KVM ?????

KVM?Kernel-based Virtual Machine?? Linux ?????????????????????? Linux ????? Hypervisor
????????????????????

????? KVM ??????????????????????

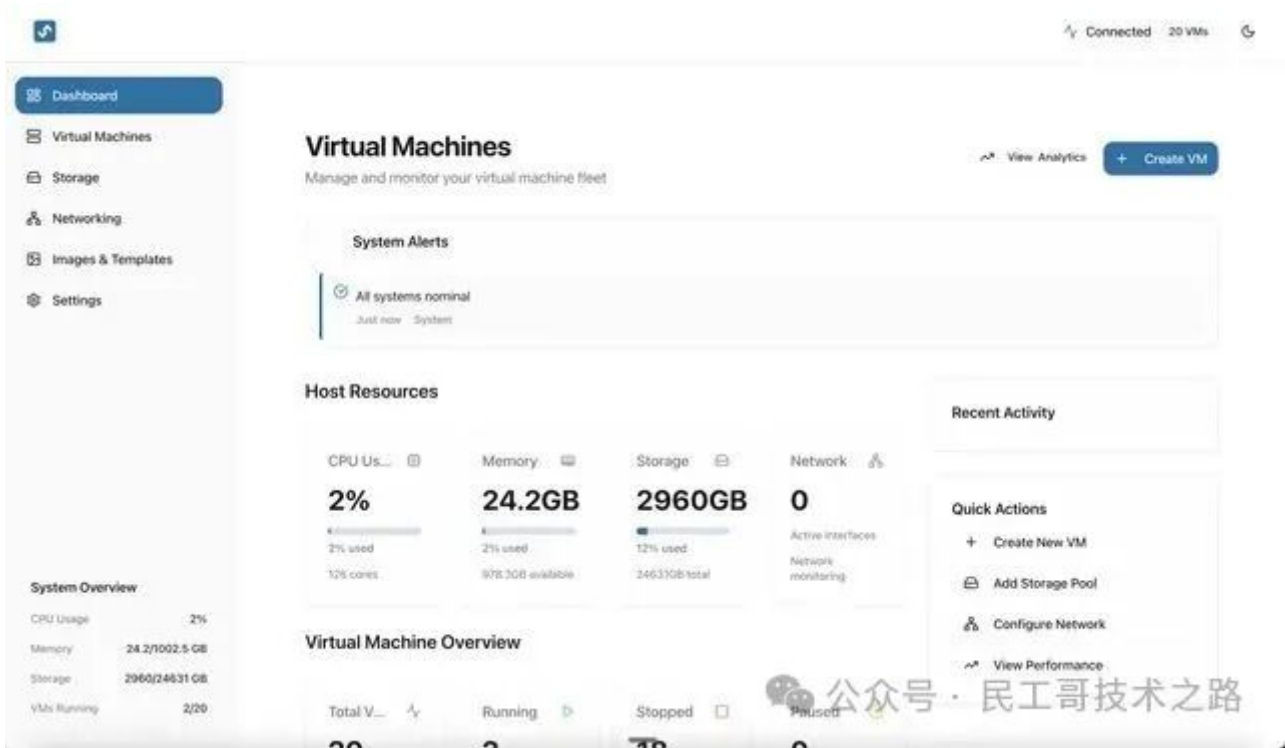
????????? **KVM** ?????????????? **virsh?virt-manager?libvirt** ??????

??

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

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

?????????????????Flint?



?????????????????Flint ??? KVM ??????????

?????

?????

?????? ????? 11MB??? Web UI?CLI ? API ??????????????????XML ????

????? x86 ? ARM ?????????????????????? /usr/local/bin?

????????

Web UI??? Next.js ? Tailwind ?????????????????????????????????

CLI ????? Web UI ?????????????????? flint vm list ???????

API ????? RESTful API????????????????? curl ?? API ???????

?????

?????? Web UI ?????? API ?? Bearer Token??????????????

??????????

?????

????? JSON/YAML ??????????????CPU?????????????

```
{  
  "name": "web_server",  
  "memory": "4G",  
  "cpus": 2,  
  "disk": "/var/lib/flint/images/web.qcow2",  
  "network": "bridge=br0",  
  "cloud_init": "/var/lib/flint/cloud-init/web.iso"  
}
```

Cloud-Init ????SSH ??????????????

?????

????? CLI ? API ???/?/?????????????

```
flint vm start --all # ??????  
flint vm stop --name=db1,db2 # ??????
```

?????CPU?????????????

?????

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

```
flint vm snapshot --name=test --snapshot=pre_upgrade
```

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

?????

?????Flint ?????????????? Ubuntu 24.04?

```
flint image download ubuntu-24.04
```

```
?????????? /var/lib/flint/images/????????????????????
```

```
??????
```

```
flint image list
```

```
?????
```

NAME	SIZE	PATH
ubuntu-24.04	2.5GB	/var/lib/flint/images/ubuntu-24.04.qcow2
centos-9	1.8GB	/var/lib/flint/images/centos-9.qcow2

Cloud-Init ??

```
Flint ??? Cloud-Init????????????????????
```

```
?? Cloud-Init ?? ??????? SSH ????????????
```

```
?????
```

```
flint vm launch --name=web_server --image=ubuntu-24.04 --cloud-  
init=/var/lib/flint/cloud-init/web.iso
```

```
?????????? Cloud-Init ???????????
```

```
?????
```

```
Flint ???????????????????
```

```
#??????  
flint storage volume list default  
  
#?????  
flint storage volume create --name=data_vol --size=10G
```


????????

- ??????

Flint ???????? Web UI ???????? **br0** ???

```
brctl addbr br0          # ????  
brctl addif br0 eth0    # ?????? eth0 ??????  
ifconfig br0 up        # ????
```

- ???????

??

```
flint vm launch --name=vm1 --image=ubuntu-24.04 --network=br0
```

VLAN ? VXLAN

- VLAN ??

Flint ??? VLAN ?????????????????????? VLAN ID 100?

```
flint vm network-config --name=vm1 --vlan=100
```

- VXLAN ????

?????????????Flint ?? VXLAN ??????????????????????

```
flint vxlan create --vni=1001 --local-ip=192.168.1.100 --remote-ip=192.168.1.101
```

?????????? VXLAN ???VNI 1001?????????????????

????????

- ??????

Flint ?????????????????????? IP ?????????????????? Cloud-Init ??????????

```
flint vm launch --name=web_server --image=ubuntu-24.04 --cloud-  
init=/var/lib/flint/cloud-init/network.iso
```

???? `network.iso` ?????? IP ? DHCP ????????????

- ????????

Flint ????????????????? Prometheus ? Grafana ????????????????? API ???? `br0` ??????

```
curl http://<flint-host>:8081/api/network/br0/stats
```

??????

- ????????

Flint ?????????????????????/???????????????? SSH?22 ???? HTTP?80 ???? ?

```
flint vm firewall-add --name=vm1 --rule="allow tcp port 22,80"
```

- MAC ???? ?

?? MAC ??????Flint ?????????? MAC ??? ?

```
flint vm mac-bind --name=vm1 --mac=00:16:3e:xx:xx:xx
```

API ??

Flink ?? RESTful API ??

??????????

???????? POST ??? JobManager ?? Flink ???JAR ?? SQL ????????

```
curl -X POST -H "Content-Type: application/json" -d @job.json http://<jobmanager-  
host>:8081/jars/upload
```

????? GET ??????????????????

```
curl http://<jobmanager-host>:8081/jobs/<job-id>
```

??????

??? **TaskManager** API TaskManager ??????????

```
curl -X POST -H "Content-Type: application/json" -d '{"slots":4}' http://<jobmanager-host>:8081/taskmanagers/scale
```

??????

????? Prometheus ? Grafana ??????????????????

???? API ?? TaskManager ? JobManager ??????????

```
curl http://<taskmanager-host>:8081/taskmanagers/<tm-id>/logs/taskmanager.log
```

??????

????	?? KVM ?????? virsh/virt-manager/libvirt?	Flint ????
????	???????? Python/libvirt???????? 50MB+?	??????<11MB????????????
????	CLI?virsh?+ GUI?virt-manager ??????????	?? Web UI/CLI/API ??????????
????	????????CPU ????? 10-30%?????????	???????????????? 50%?????????
????	???????? libvirtd ????????????? RBAC	????????+Token??RBAC ???TLS 1.3 ??
????	?? XML ??????????????????????	??????JSON/YAML???? CPU/ ??????????????
???	?????????????	??????/?/?Git?Hub ??????????
????	??? libvirt API?????????????????????	?????Web UI ??????CLI ??????
??????	?????????????????????	????????/??????????x86/ARM?
?????	???????????????? Ansible???????	?? Cloud-Init ???API ?? CI/CD ???
????	????????/??????????	??? root ??????????????????



Flint ??? KVM ???????????

10 ?????1????????????????CPU ??????? 50%??????????

????????????????+Token?+ RBAC ???????????

?? Cloud-Init????????????????????API ????? CI/CD????????????/????DevOps ???

?? KVM ?????????

1 ??? + 1 ???

GitHub?https://github.com/ccheshirecat/flint

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