

# Enabling eBPF Super Powers on ARM64 with Cilium



Jianlin Lv

Trevor Tao

October 28, 2020

# Preface



DATADOG



Google Cloud

 Alibaba Cloud



Adobe



SAP Concur



Trip.com

 finleap

# Arm ecosystem of CNI



PROJECT  
**CALICO**



cilium



**MULTUS**



**Contiv**

# Support Arm64

- Cilium enable on aarch64
  - <https://github.com/cilium/cilium/issues/9898>
  - Fix compiling and runtime issue on Arm64;
  - Multi-arch support for cilium-related images
  - CI/CD
    - Travis
  - Unit test

# Travis CI

- Arm64 Full VM
  - arm64-graviton2

Build jobs View config ●

✓ # 24261.1	AMD64	Focal	</> Go: 1.1...	no environment variables	🕒 27 min 3 sec
✓ # 24261.2	arm64-graviton2	Focal	</> Go: 1.1...	no environment variables	🕒 24 min

- Refer to:
  - <https://docs.travis-ci.com/user/multi-cpu-architectures>
  - <https://github.com/cilium/cilium/pull/13033>

# Docker Images

- Github Action + Docker Buildx
- Issue
  - <https://github.com/cilium/proxy/runs/1250471418>

Quick connect...

2. thunderX2-ofice

3. net-arm-amp-01.shanghai.arm.com

4. net-arm-amp-01.shanghai.arm.com

/home/jianlin/

- Name
- ..
- .cache
- .config
- .docker
- .gnupg
- .go
- .helm
- .local
- .repoconfig
- .ssh
- .subversion
- .vim
- code
- etc
- go
- iec-code
- macbin
- qemu
- .bash\_history
- .bash\_logout
- .bashrc
- .bzip.log
- .gitconfig
- .profile
- .repo\_gitconfig.json
- .selected\_editor
- .sudo\_as\_admin\_successful
- .viminfo
- .wget-hsts
- .Xauthority
- affinity.go
- bpf\_lb\_list.go
- cilium-2020-03-27.tar.gz
- etl...

Remote monitoring

Follow terminal folder

```

root@jianlin:/home/jianlin/code/cilium-install/cilium-master/install/kubernetes#
root@jianlin:/home/jianlin/code/cilium-install/cilium-master/install/kubernetes# lscpu
Architecture:          aarch64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                8
On-line CPU(s) list:  0-7
Thread(s) per core:    1
Core(s) per socket:    8
Socket(s):             1
NUMA node(s):         1
Vendor ID:             APM
Model:                 2
Model name:            X-Gene
Stepping:              0x3
BogoMIPS:              80.00
NUMA node0 CPU(s):    0-7
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf:   Not affected
Vulnerability Mds:    Not affected
Vulnerability Meltdown: Mitigation; PTI
Vulnerability Spec store bypass: Vulnerable
Vulnerability Spectre v1: Mitigation; __user pointer sanitization
Vulnerability Spectre v2: Vulnerable
Vulnerability Srbds:   Not affected
Vulnerability Tsx async abort: Not affected
Flags:                 fp asimd evtstrm aes pmull sha1 sha2 crc32 cpuid
root@jianlin:/home/jianlin/code/cilium-install/cilium-master/install/kubernetes# kubectl get pod -n kube-system -o wide
uNAME          READY   STATUS    RESTARTS   AGE   IP              NODE   NOMINATED NODE   READINESS GATES
coredns-f9fd979d6-44946   0/1    ContainerCreating   0      4m20s   <none>         jianlin   <none>         <none>
coredns-f9fd979d6-svhcd   0/1    ContainerCreating   0      4m20s   <none>         jianlin   <none>         <none>
etcd-jianlin             1/1    Running            0      4m27s   10.169.208.214   jianlin   <none>         <none>
kube-apiserver-jianlin   1/1    Running            0      4m26s   10.169.208.214   jianlin   <none>         <none>
kube-controller-manager-jianlin 1/1    Running            0      4m26s   10.169.208.214   jianlin   <none>         <none>
kube-scheduler-jianlin  1/1    Running            0      4m27s   10.169.208.214   jianlin   <none>         <none>
root@jianlin:/home/jianlin/code/cilium-install/cilium-master/install/kubernetes# kubectl get pod -o wide
No resources found in default namespace.
root@jianlin:/home/jianlin/code/cilium-install/cilium-master/install/kubernetes# kubectl get node -o wide
ubectl get service
NAME          STATUS   ROLES    AGE   VERSION   INTERNAL-IP   EXTERNAL-IP   OS-IMAGE           KERNEL-VERSION   CONTAINER-RUNTIME
jianlin      Ready   master   4m39s   v1.19.0   10.169.208.214   <none>         Ubuntu 20.04 LTS   5.9.0-rc1+       docker://19.3.12
jianlin-100  Ready   <none>   4m7s   v1.19.1   10.169.210.125   <none>         Ubuntu 20.04 LTS   5.9.0-rc1+       docker://19.3.12
root@jianlin:/home/jianlin/code/cilium-install/cilium-master/install/kubernetes# kubectl get service

```

# Future Work

- Cilium benchmark on Arm64
- Enable End-To-End Testing



# Cilium Channel for Arm64

- <https://cilium.slack.com/archives/C0125S9TQD8>



arm

Thank You

Danke

Merci

谢谢

ありがとう

Gracias

Kiitos

감사합니다

धन्यवाद

شكرًا

ধন্যবাদ

תודה