Risoluzione dei problemi relativi ai POD con i comandi per Kubernetes e CEE OPS-Center

Sommario

Introduzione

In questo documento viene descritto come risolvere i problemi relativi ai POD con i comandi per Kubernetes e CEE OPS-Center.

Risoluzione dei problemi relativi ai POD con i comandi per Kubernetes e CEE OPS-Center

1. CLI k8s

1.1 Elenca tutti gli spazi dei nomi

Comando:

```
kubectl get namespace
```

Esempio:

```
cisco@brusmi-master1:~$ kubectl get namespace
NAME              STATUS   AGE
cee-cee           Active   6d
default           Active   6d
```

```
kube-node-lease   Active   6d
kube-public       Active   6d
kube-system       Active   6d
lfs               Active   6d
nginx-ingress     Active   6d
smf-data          Active   6d
smi-certs         Active   6d
smi-vips          Active   6d
```

1.2 Elencare tutti i servizi per un particolare spazio dei nomi:

Comando:

```
kubectl get svc -n <namespace>
```

Esempio:

```
cisco@brusmi-master1:~$ kubectl get svc -n smf-data
NAME                                TYPE        CLUSTER-IP       EXTERNAL-IP    PORT(S)
base-entitlement-smf                ClusterIP   10.97.93.253     <none>         8000/TCP
datastore-ep-session                ClusterIP   10.101.15.88     <none>         8882/TCP
datastore-notification-ep           ClusterIP   10.110.182.26    <none>         8890/TCP
datastore-tls-ep-session            ClusterIP   10.110.115.33    <none>         8883/TCP
documentation                       ClusterIP   10.110.85.239    <none>         8080/TCP
etcd                                ClusterIP   None             <none>         2379/TCP,7070/TCP
etcd-smf-data-etcd-cluster-0        ClusterIP   10.103.194.229   <none>         2380/TCP,2379/TCP
grafana-dashboard-app-infra         ClusterIP   10.98.161.155    <none>         9418/TCP
grafana-dashboard-cdl               ClusterIP   10.104.32.111    <none>         9418/TCP
grafana-dashboard-smf               ClusterIP   10.106.64.191    <none>         9418/TCP
gtpc-ep                             ClusterIP   10.99.49.25      x.x.x.201   9003/TCP,8080/TCP
helm-api-smf-data-ops-center        ClusterIP   10.109.206.198   <none>         3000/TCP
kafka                               ClusterIP   None             <none>         9092/TCP,7070/TCP
```

```
li-ep                                   ClusterIP   10.106.134.35    <none>          9003/TCP,8080/TCP
local-ldap-proxy-smf-data-ops-center    ClusterIP   10.99.160.226    <none>          636/TCP,369/TCP
oam-pod                                 ClusterIP   10.105.223.47    <none>          9008/TCP,7001/TCP,88
ops-center-smf-data-ops-center          ClusterIP   10.103.164.204   <none>          8008/TCP,8080/TCP,20
smart-agent-smf-data-ops-center         ClusterIP   10.97.143.81     <none>          8888/TCP
smf-n10-service                         ClusterIP   10.102.197.22    10.10.10.205    8090/TCP
smf-n11-service                         ClusterIP   10.108.109.186   10.10.10.203    8090/TCP
smf-n40-service                         ClusterIP   10.111.170.158   10.10.10.206    8090/TCP
smf-n7-service                          ClusterIP   10.102.140.179   10.10.10.204    8090/TCP
smf-nodemgr                             ClusterIP   10.102.68.172    <none>          9003/TCP,8884/TCP,92
smf-protocol                            ClusterIP   10.111.219.156   <none>          9003/TCP,8080/TCP
smf-rest-ep                             ClusterIP   10.109.189.99    <none>          9003/TCP,8080/TCP,92
smf-sbi-service                         ClusterIP   10.105.176.248   10.10.10.201    8090/TCP
smf-service                             ClusterIP   10.100.143.237   <none>          9003/TCP,8080/TCP
swift-smf-data-ops-center               ClusterIP   10.98.196.46     <none>          9855/TCP,50055/TCP,5
zookeeper                               ClusterIP   None             <none>          2888/TCP,3888/TCP
zookeeper-service                       ClusterIP   10.109.109.102   <none>          2181/TCP,7070/TCP
```

1.3 Elencare tutti i pod per un particolare spazio dei nomi:

Comando:

```
kubectl get pods -n <namespace>
```

Esempio:

```
cisco@brusmi-master1:~$ kubectl get pods -n smf-data
NAME                                          READY   STATUS    RESTARTS   AGE
api-smf-data-ops-center-57c8f6b4d7-wt66s      1/1     Running   0          6d
base-entitlement-smf-fcdb664d-fkgss           1/1     Running   0          6d
cache-pod-0                                   1/1     Running   0          6h53m
```

```
cache-pod-1                                       1/1     Running   0          6h53m
cdl-ep-session-c1-dbb5f7874-4gmfr                 1/1     Running   0          6h53m
cdl-ep-session-c1-dbb5f7874-5zbqw                 1/1     Running   0          6h53m
cdl-index-session-c1-m1-0                         1/1     Running   0          6h53m
cdl-slot-session-c1-m1-0                          1/1     Running   0          6h53m
documentation-5dc8d5d898-mv6kx                    1/1     Running   0          6d
etcd-smf-data-etcd-cluster-0                      1/1     Running   0          6h53m
grafana-dashboard-app-infra-5b8dd74bb6-xvlln      1/1     Running   0          6h53m
grafana-dashboard-cdl-5df868c45c-vbr4r            1/1     Running   0          6h53m
grafana-dashboard-smf-657755b7c8-fvbdt            1/1     Running   0          6h53m
gtpc-ep-n0-0                                      1/1     Running   0          6h53m
kafka-0                                           1/1     Running   0          6h53m
li-ep-n0-0                                        1/1     Running   0          6h53m
oam-pod-0                                         1/1     Running   0          6h53m
ops-center-smf-data-ops-center-7fbb97d9c9-tx7qd   5/5     Running   0          6d
smart-agent-smf-data-ops-center-6667dcdd65-2h7nr  0/1     Evicted   0          6d
smart-agent-smf-data-ops-center-6667dcdd65-6wfvq  1/1     Running   0          4d18h
smf-nodemgr-n0-0                                  1/1     Running   0          6h53m
smf-protocol-n0-0                                 1/1     Running   0          6h53m
smf-rest-ep-n0-0                                  1/1     Running   0          6h53m
smf-service-n0-0                                  1/1     Running   5          6h53m
smf-udp-proxy-0                                   1/1     Running   0          6h53m
swift-smf-data-ops-center-68bc75bbc7-4zdc7        1/1     Running   0          6d
zookeeper-0                                       1/1     Running   0          6h53m
zookeeper-1                                       1/1     Running   0          6h52m
zookeeper-2                                       1/1     Running   0          6h52m
```

1.4 Elencare i dettagli completi per nomi di pod specifici (etichette, immagini, porte, volumi, eventi e altro ancora).

Comando:

```
kubectl describe pods <pod_name> -n <namespace>
```

Esempio:

```
cisco@brusmi-master1:~$ kubectl describe pods smf-service-n0-0 -n smf-data
```

```
smf-service-n0-0    <<< POD name
smf-data            <<< Namespace
```

2. Registri k8s e processore

2.1 Ottenere il nome del contenitore per il pod specifico:

Comando:

```
kubectl describe pods <pod_name> -n <namespace> | grep Containers -A1
```

Esempio:

```
cisco@brusmi-master1:~$ kubectl describe pods smf-service-n0-0 -n smf-data | grep Containers -A1
```

Contenitori:

```
 smf-service:
--
  ContainersReady   True
  PodScheduled      True
```

2.2 Cercare i registri quando si osserva un guasto del baccello su Kubernetes:

Comando:

```
kubectl get pods -n <namespace> | grep -v Running
```

Esempio:

```
cisco@brusmi-master1:~$ kubectl get pods -n smf-data | grep -v Running

NAME                                                READY   STATUS             RESTARTS   AGE

smart-agent-smf-data-ops-center-6667dcdd65-2h7nr    0/1     Evicted            0          5d23h

smf-service-n0-0                                    0/1     CrashLoopBackOff   2          6h12m
```

Comando:

```
kubectl logs <pod_name> -c <container_name> -n <namespace>
```

Esempio:

```
cisco@brusmi-master1:~$ kubectl logs smf-service-n0-0 -c smf-service -n smf-data

/opt/workspace

-rwxrwxrwx 1 root root 84180872 Mar 31 06:18 /opt/workspace/smf-service

Launching: /opt/workspace/tini /opt/workspace/smf-service

2020-06-09 20:26:16.341043 I | proto: duplicate proto type registered: internalmsg.SessionKey

2020-06-09 20:26:16.341098 I | proto: duplicate proto type registered: internalmsg.NInternalTxnMsg

2020-06-09 20:26:16.343170 I | smf-service [INFO] [main.go:18] [smfservice] ##########################M

#########

2020-06-09 20:26:16.343197 I | smf-service [INFO] [main.go:19] [smfservice] ##########################

#########

2020-06-09 20:26:16.343210 I | smf-service [INFO] [main.go:20] [smfservice]                        SMF-

2020-06-09 20:26:16.343221 I | smf-service [INFO] [main.go:21] [smfservice] ##########################

#########
```

```
2020-06-09 20:26:16.343232 I | smf-service [INFO] [main.go:22] [smfservice] ##########################
#########
2020/06/09 20:26:16.343 smf-service [DEBUG] [Tracer.go:181] [unknown] Loaded initial tracing configurat
aegerTransportType: , TracerEndpoint: , ServiceName: smf-service, TracerServiceName: , EnableTracePerce
.
.
2020/06/09 20:44:28.157 smf-service [DEBUG] [RestRouter.go:24] [infra.rest_server.core] Rest message re
2020/06/09 20:44:28.158 smf-service [DEBUG] [RestRouter.go:43] [infra.rest_server.core] Set Ping as nam
2020/06/09 20:44:28.159 smf-service [INFO] [ApplicationEndpoint.go:333] [infra.application.core] Ping s
2020/06/09 20:44:30.468 smf-service [DEBUG] [MetricsServer_v1.go:305] [infra.application.core] Checkpoi
2020/06/09 20:44:31.158 smf-service [DEBUG] [RestRouter.go:24] [infra.rest_server.core] Rest message re
2020/06/09 20:44:31.158 smf-service [DEBUG] [RestRouter.go:43] [infra.rest_server.core] Set Ping as nam
2020/06/09 20:44:31.158 smf-service [INFO] [ApplicationEndpoint.go:333] [infra.application.core] Ping s

smf-service-n0-0    <<< POD name
smf-service         <<< Container Name
smf-data            <<< Namespace
```

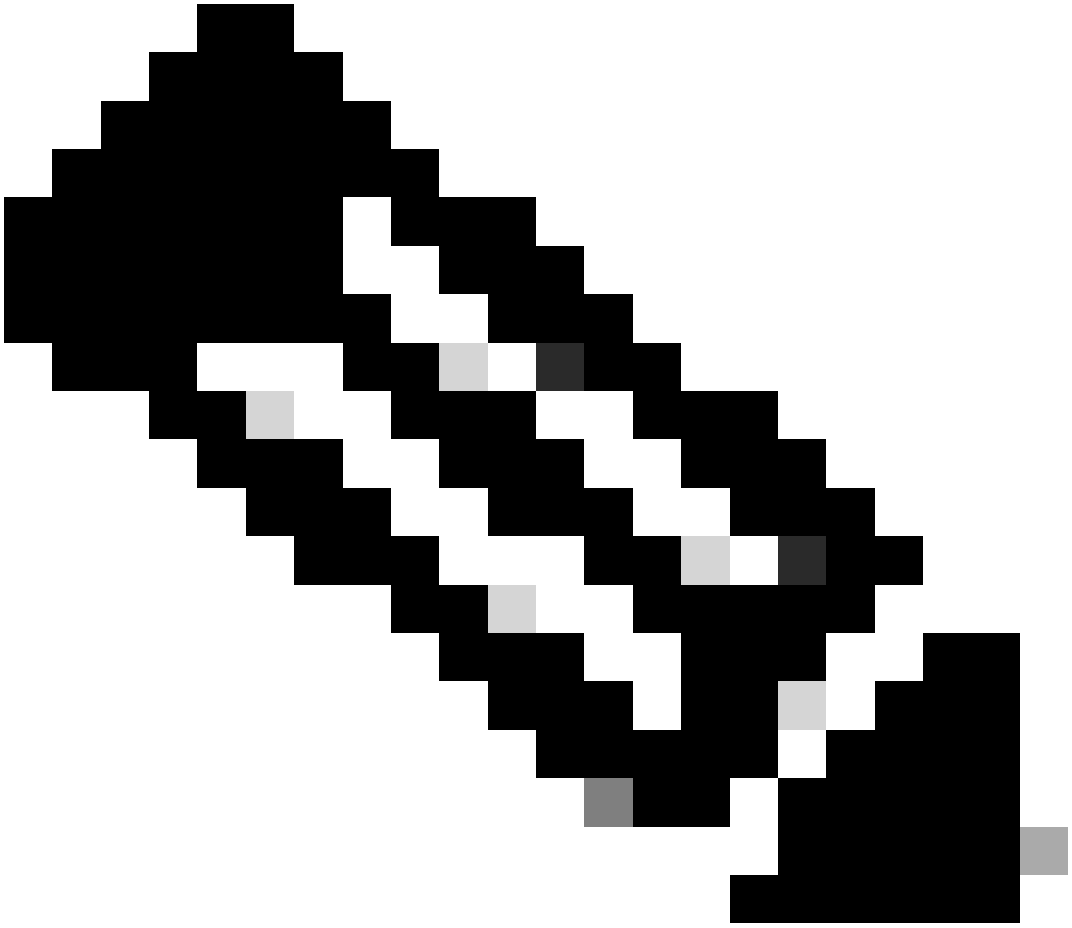
2.3 Verificare se sono stati generati dump di corek:

Comando:

```
ls -lrt /var/lib/systemd/coredump/
```

Esempio:

```
cisco@brusmi-master1:~$ ls -lrt /var/lib/systemd/coredump/
total 0
```



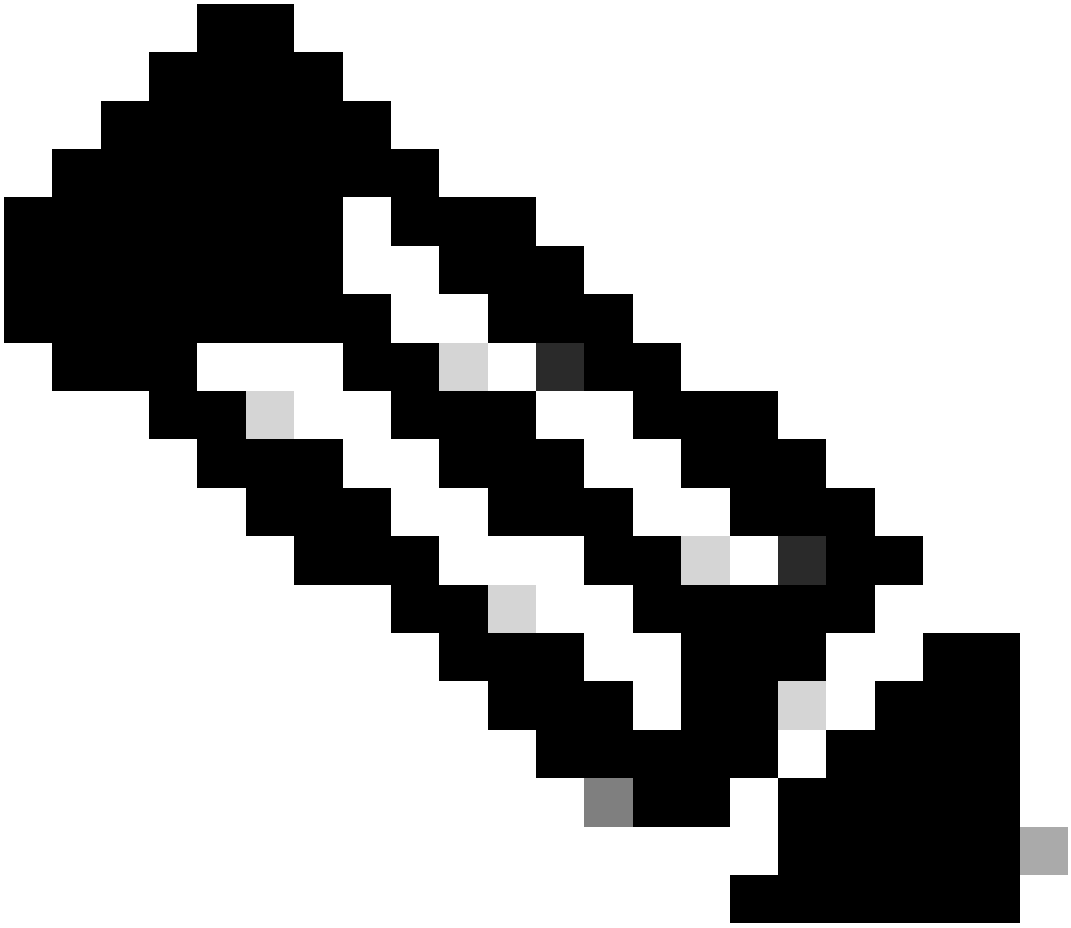
Nota: Il file di base deve essere generato nel **/var/lib/systemd/coredump/** percorso della VM corrispondente. Il nucleo è disponibile anche nel dashboard TAC.

3. Creare TAC-Debug su CEE

3.1 Accedere al centro operativo Cee da Master k8s:

```
cisco@brusmi-master1:~$ kubectl get namespace
NAME              STATUS   AGE
cee-cee           Active   5d3h
default           Active   5d3h
kube-node-lease   Active   5d3h
kube-public       Active   5d3h
```

```
kube-system       Active   5d3h
lfs               Active   5d3h
nginx-ingress     Active   5d3h
smf-data          Active   5d3h
smi-certs         Active   5d3h
smi-vips          Active   5d3h


cisco@brusmi-master1:~$ ssh -p 2024 admin@$(kubectl get svc -n cee-cee | grep ^ops-center | awk '{print
 admin@10.102.44.219's password:
Welcome to the cee CLI on brusmi/cee
admin connected from 192.x.0.1 using ssh on ops-center-cee-cee-ops-center-79cf55b49b-6wrh9
[brusmi/cee] cee#
```



Nota: Nell'esempio riportato in precedenza, lo spazio dei nomi CEE è "cee-cee". Se necessario, sostituire il nome.

3.2 Generare l'ID pacchetto TAC per fare riferimento ai file di raccolta recuperati:

Comando:

```
tac-debug-pkg create from <Start_time> to <End_time>
```

Esempio:

```
[brusmi/cee] cee# tac-debug-pkg create from 2020-06-08_14:00:00 to 2020-06-08_15:00:00

response : Tue Jun  9 00:22:17 UTC 2020 tac-debug pkg ID : 1592948929
```

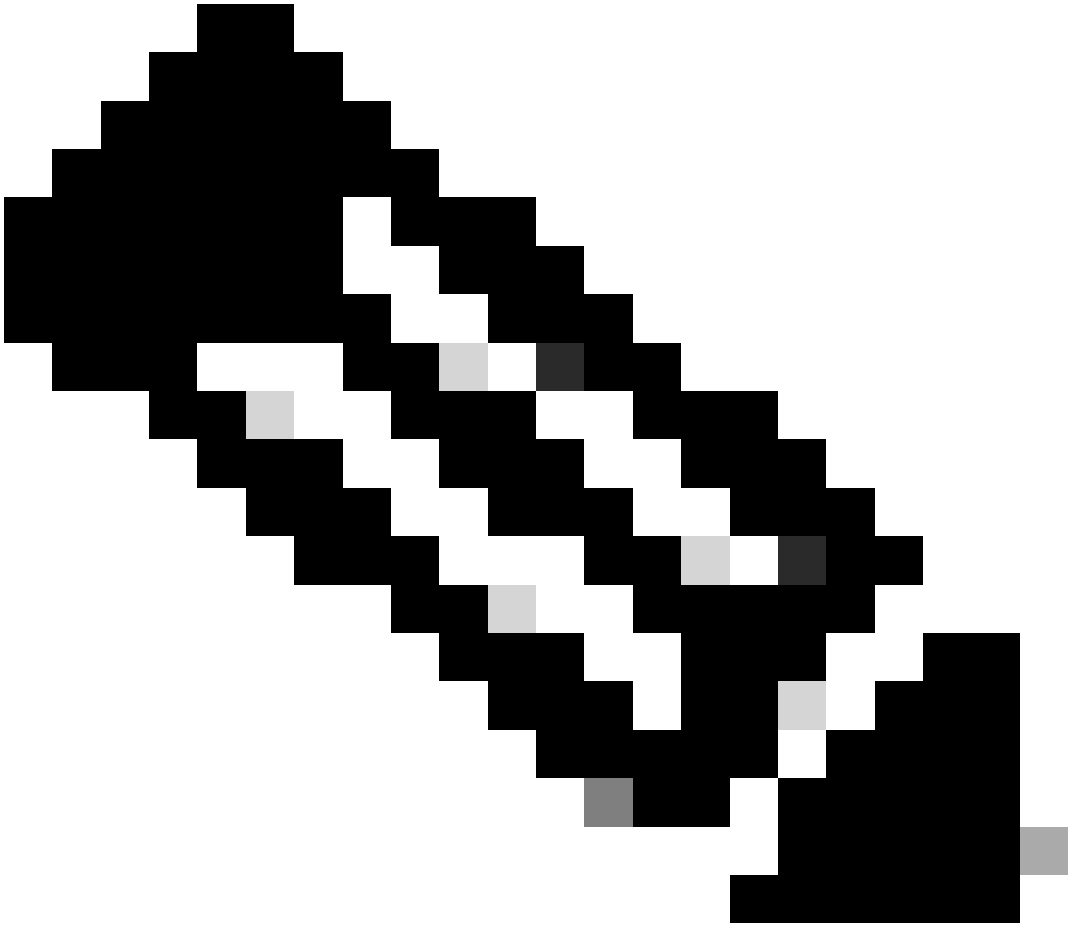
Inoltre, è possibile includere filtri aggiuntivi come namespace o pod_name come indicato di seguito:

Comando:

```
tac-debug-pkg create from <Start_time> to <End_time> logs-filter { namespace <namespace> pod_name <pod_
```

Esempio:

```
[brusmi/cee] cee# tac-debug-pkg create from 2020-06-08_14:00:00 to 2020-06-08_15:00:00 logs-filter { na

response : Tue Jun  9 00:28:49 UTC 2020 tac-debug pkg ID : 1591662529
```

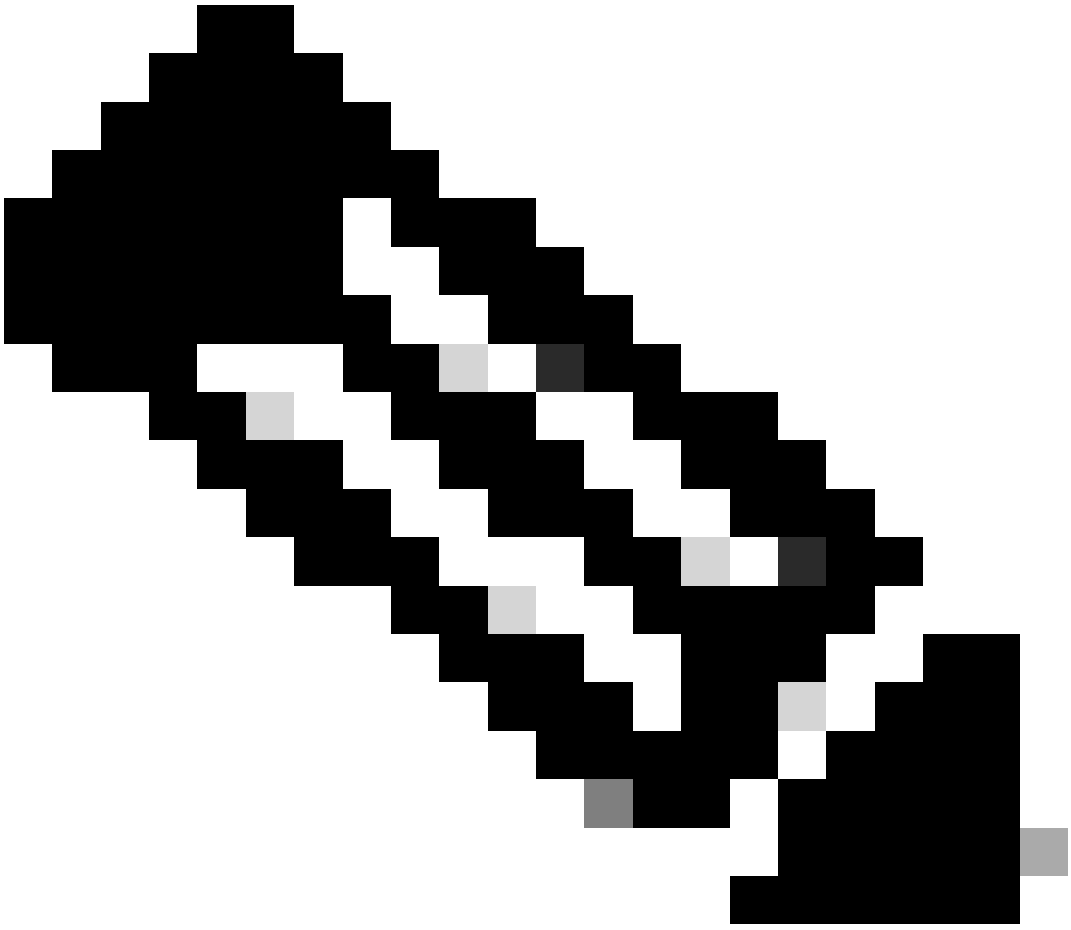


Nota: Si consiglia di generare un ID pacchetto tac per un periodo di tempo di slot (1 ora o massimo 2 ore).

3.3 Visualizzare lo stato di ciascun servizio:

```
[brusmi/cee] cee# tac-debug-pkg status

response : Tue Jun  9 00:28:51 UTC 2020

Tac id: 1591662529

Gather core: completed!

Gather logs: in progress

Gather metrics: in progress

Gather stats: completed!
```

```
Gather config: completed!

[brusmi/cee] cee#



[brusmi/cee] cee# tac-debug-pkg status

response : Tue Jun  9 00:43:45 UTC 2020

No active tac debug session           <<< If none active tac debug session is displayed, it means that
```



Nota: Se lo spazio su disco non è disponibile, rimuovere i file di debug meno recenti.

```
[brusmi/cee] cee# tac-debug-pkg create from 2020-06-08_09:00:00 to 2020-06-08_10:00:00 logs-filter { na

response : Tue Jun  9 00:45:48 UTC 2020
```

```
Available disk space on node is less than 20 %. Please remove old debug files and retry.
```

```
[brusmi/cee] cee# tac-debug-pkg delete tac-id 1591662529
```

3.4 Creare un ID di debug TAC per raccogliere solo le metriche:

```
[nyucs504-cnat/global] cee# tac-debug-pkg create from 2021-02-24_12:30:00 to 2021-02-24_14:30:00 cores
response : Wed Feb 24 19:39:49 UTC 2021 tac-debug pkg ID : 1614195589
```

4. Scarica debug TAC

Al momento, sono disponibili tre opzioni per scaricare il debug TAC da CEE:

4.1 SFTP da Master VIP (meno consigliato, richiede molto tempo).

4.1.1 Ottenere l'URL per scaricare i log raccolti su **tac package ID** :

Comando:

```
kubectl get ingress -n <namespace> | grep show-tac
```

Esempio:

```
cisco@brusmi-master1:~$ kubectl get ingress -n cee-cee | grep show-tac
show-tac-manager-ingress                show-tac-manager.cee-cee-smi-show-tac.192.168.208.10.xxx.x
```

4.1.2 Comprimere e ottenere il file tac-debug dal **show-tac-manager** pod:

r. Ottenere l'ID del pod show-tac.

Comando:

```
kubectl get pods -n <namespace> | grep show-tac
```

Esempio:

```
cisco@brusmi-master1:~$ kubectl get pods -n cee-cee | grep show-tac
show-tac-manager-85985946f6-bflrc 2/2 Running 0 12d
```

b. Eseguire il comando exec in **show-tac pod**e comprimere i registri di debug TAC.

Comando:

```
kubectl exec -it -n <namespace> <pod_name> bash
```

Esempio:

```
cisco@brusmi-master1:~$ kubectl exec -it -n cee-cee show-tac-manager-85985946f6-bflrc bash
Defaulting container name to show-tac-manager.
Use 'kubectl describe pod/show-tac-manager-85985946f6-bflrc -n cee-cee' to see all of the containers in
groups: cannot find name for group ID 101
groups: cannot find name for group ID 190
groups: cannot find name for group ID 303
I have no name!@show-tac-manager-85985946f6-bflrc:/show-tac-manager/bin$ cd /home/tac/
I have no name!@show-tac-manager-85985946f6-bflrc:/home/tac$ tar -zcvf tac-debug_1591662529.tar.gz 1591
1591662529/
1591662529/config/
1591662529/config/192.x.1.14_configuration.tar.gz.base64
1591662529/stats/
1591662529/stats/Stats_2020-06-08_14-00-00_2020-06-08_15-00-00.tar.gz
1591662529/manifest.json
1591662529/metrics/
1591662529/metrics/Metrics_2020-06-08_14-00-00_2020-06-08_15-00-00.tar.gz
1591662529/web/
1591662529/web/index.html
1591662529/logs/
1591662529/logs/brusmi-master1/
1591662529/logs/brusmi-master1/brusmi-master1_Logs_2020-06-08_14-00-00_2020-06-08_15-00-00.tar.gz
```

```
I have no name!@show-tac-manager-85985946f6-bflrc:/home/tac$ ls

1591662490  1591662529  1592265088  tac-debug_1591662529.tar.gz
```

4.1.3 Copiare il file nella **/tmp** directory dell'indirizzo VIP principale:

Comando:

```
kubectl cp <namespace>/<show-tac_pod_name>:/home/tac/<file_name.tar.gz> /tmp/<file_name.tar.gz>
```

Esempio:

```
cisco@brusmi-master1:~$ kubectl cp cee-cee/show-tac-manager-85985946f6-bflrc:/home/tac/tac-debug_159166

Defaulting container name to show-tac-manager.

tar: Removing leading `/' from member names

cisco@brusmi-master1:~$ cd /tmp

cisco@brusmi-master1:/tmp$ ls

cee.cfg

tac-debug_1591662529.tar.gz

tiller_service_acct.yaml
```

4.1.4 Trasferire il file tramite sftp da Master VIP.

4.2 Scaricare il comando TAC Debug con **wget** (macOS/Ubuntu).

4.2.1 Ottenere il collegamento show-tac dall'output "k8s get in entrata":

```
cisco@brusmi-master1:~$ kubectl get ingress -n cee-cee | grep show-tac

show-tac-manager-ingress                show-tac-manager.cee-cee-smi-show-tac.192.168.208.10.xxx.x
```

4.2.2 Inserire il **wget** comando dal terminale del PC:

```
wget -r -np https://show-tac-manager.cee-cee-smi-show-tac.192.168.208.10.xxx.x/tac/
<tac-id>/ --no-check-certificate --http-user=<NTID_username>
```

```
--http-password=<NTID_password>
```

5. Raccogliere i registri da CEE per tutti i POD SMF

5.1 Accesso a **smf-data**Ops-Center da Master k8s:

```
cisco@brusmi-master1:~$ ssh -p 2024 admin@$(kubectl get svc -n smf-data | grep ^ops-center | awk '{prin
 admin@10.103.164.204's password:
Welcome to the smf CLI on brusmi/data
admin connected from 192.x.0.1 using ssh on ops-center-smf-data-ops-center-7fbb97d9c9-tx7qd
```

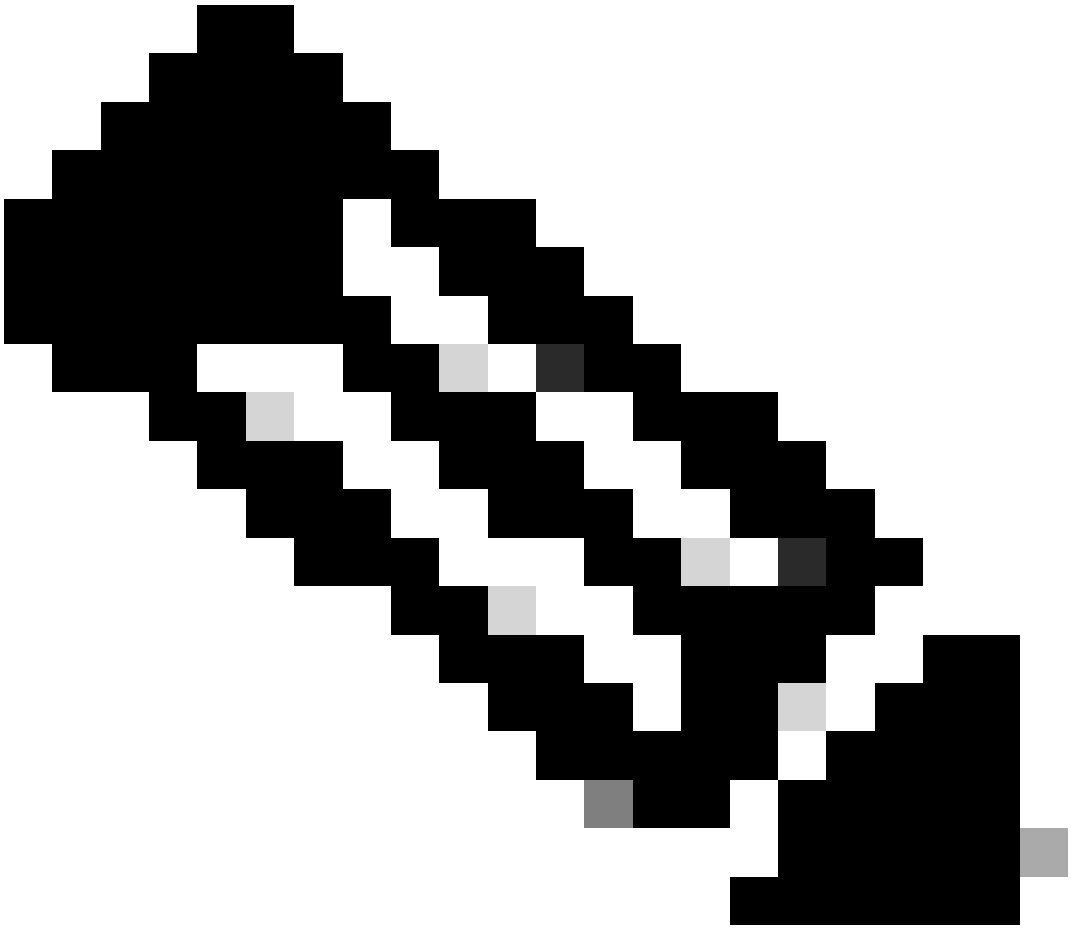
5.2 Confermare se l'opzione "logging level application" è abilitata:

```
[brusmi/data] smf# show running-config | i logging
logging level application debug
logging level transaction debug
logging level tracing debug
logging name infra.config.core level application debug
logging name infra.config.core level transaction debug
logging name infra.config.core level tracing debug
logging name infra.message_log.core level application debug
logging name infra.message_log.core level transaction debug
logging name infra.resource_monitor.core level application off
logging name infra.rest_server.core level application debug
```

5.3 Accedere al centro operativo Cee da Master k8s:

```
cisco@brusmi-master1:~$ ssh -p 2024 admin@$(kubectl get svc -n cee-cee | grep ^ops-center | awk '{print
 admin@10.102.44.219's password:
Welcome to the cee CLI on brusmi/cee
admin connected from 192.x.0.1 using ssh on ops-center-cee-cee-ops-center-79cf55b49b-6wrh9
```

```
[brusmi/cee] cee#
```

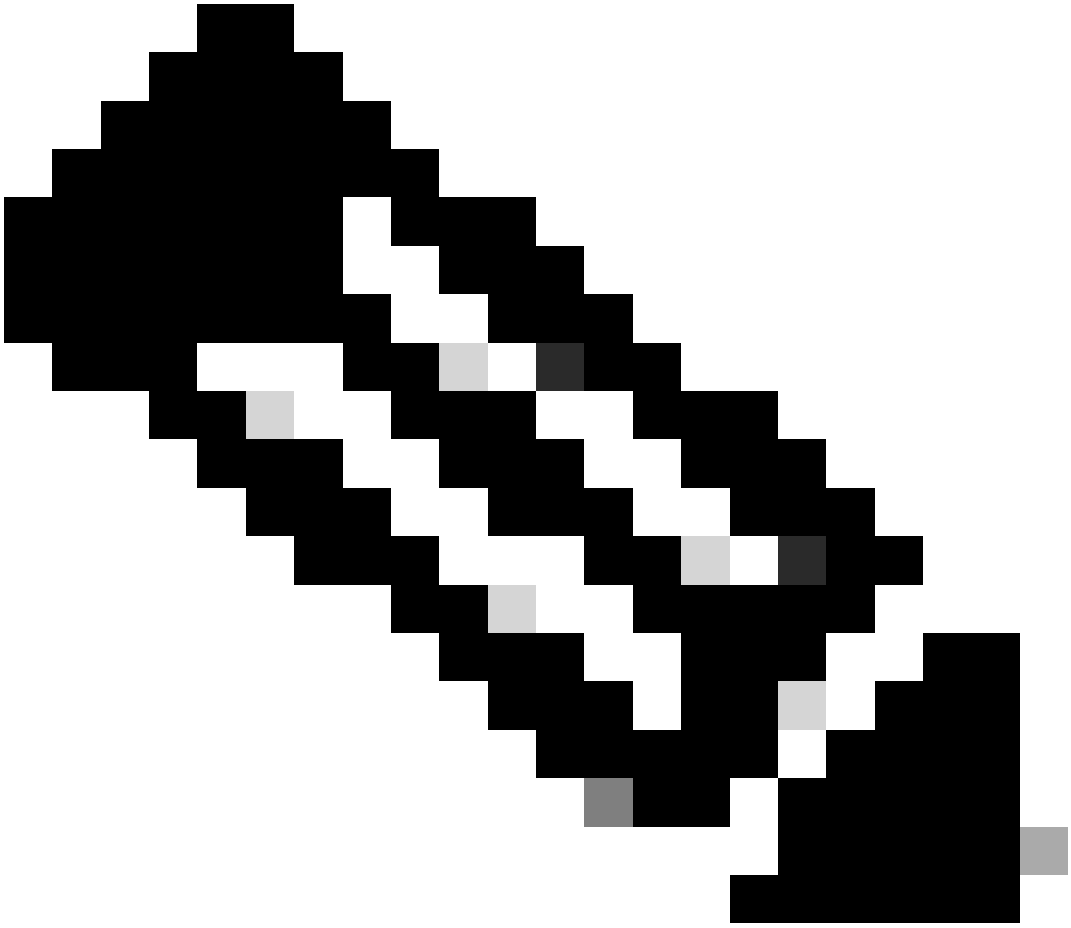


Nota: Nell'esempio riportato in precedenza, lo spazio dei nomi CEE è "cee-cee". Se necessario, sostituire il nome.

5.4 Tagliare i log di tutti i POD SMF che iniziano con "**smf-**"(**smf-nodemgr, smf-protocol, smf-rest , smf-service, smf-udp-proxy**). Raccogliere i registri per alcuni secondi e utilizzare CTRL+C per interrompere la raccolta dei dati:

```
[brusmi/cee] cee# cluster logs ^smf- -n smf-data

error: current-context must exist in order to minify

Will tail 5 logs...

smf-nodemgr-n0-0
```

```
smf-protocol-n0-0

smf-rest-ep-n0-0

smf-service-n0-0

smf-udp-proxy-0

[smf-service-n0-0] 2020/06/08 17:04:57.331 smf-service [DEBUG] [RestRouter.go:24] [infra.rest_server.co

[smf-service-n0-0] 2020/06/08 17:04:57.331 smf-service [DEBUG] [RestRouter.go:43] [infra.rest_server.co

[smf-service-n0-0] 2020/06/08 17:04:57.331 smf-service [INFO] [ApplicationEndpoint.go:333] [infra.appli

[smf-service-n0-0] 2020/06/08 17:05:00.331 smf-service [DEBUG] [RestRouter.go:24] [infra.rest_server.co

[smf-service-n0-0] 2020/06/08 17:05:00.332 smf-service [DEBUG] [RestRouter.go:43] [infra.rest_server.co

[smf-service-n0-0] 2020/06/08 17:05:00.332 smf-service [INFO] [ApplicationEndpoint.go:333] [infra.appli

[smf-service-n0-0] 2020/06/08 17:05:01.658 smf-service [DEBUG] [MetricsServer_v1.go:305] [infra.applica

[smf-service-n0-0] 2020/06/08 17:05:03.330 smf-service [DEBUG] [RestRouter.go:24] [infra.rest_server.co

[smf-service-n0-0] 2020/06/08 17:05:03.330 smf-service [DEBUG] [RestRouter.go:43] [infra.rest_server.co

[smf-service-n0-0] 2020/06/08 17:05:03.330 smf-service [INFO] [ApplicationEndpoint.go:333] [infra.appli

[smf-service-n0-0] 2020/06/08 17:05:06.330 smf-service [DEBUG] [RestRouter.go:24] [infra.rest_server.co

[smf-service-n0-0] 2020/06/08 17:05:06.330 smf-service [DEBUG] [RestRouter.go:43] [infra.rest_server.co

[smf-service-n0-0] 2020/06/08 17:05:06.330 smf-service [INFO] [ApplicationEndpoint.go:333] [infra.appli

[smf-protocol-n0-0] 2020/06/08 17:04:58.441 smf-protocol [DEBUG] [RestRouter.go:24] [infra.rest_server.

[smf-service-n0-0] 2020/06/08 17:05:06.661 smf-service [DEBUG] [MetricsServer_v1.go:305] [infra.applica

[smf-protocol-n0-0] 2020/06/08 17:04:58.441 smf-protocol [DEBUG] [RestRouter.go:43] [infra.rest_server.

[smf-protocol-n0-0] 2020/06/08 17:04:58.441 smf-protocol [INFO] [ApplicationEndpoint.go:333] [infra.app

[smf-nodemgr-n0-0] 2020/06/08 17:04:57.329 smf-nodemgr [DEBUG] [CacheClient.go:118] [infra.cache_client
```



Nota: È possibile essere più specifici nel caso in cui sia necessario raccogliere i registri da un particolare pod, contenitore o più pod.

```
### Specific pod ###

[brusmi/cee] cee# cluster logs smf-nodemgr-n0-0 -n smf-data

[brusmi/cee] cee# cluster logs smf-rest-ep-n0-0 -n smf-data

### Specific container ###

[brusmi/cee] cee# cluster logs smf-nodemgr -n smf-data

[brusmi/cee] cee# cluster logs smf-service -n smf-data

[brusmi/cee] cee# cluster logs zookeeper -n smf-data

[brusmi/cee] cee# cluster logs smf-rest-ep -n smf-data
```

```
### Multiple pods ###

[brusmi/cee] cee# cluster logs "(smf-service.|smf-rest.|smf-nodemgr.|smf-protocol.|gtpc-ep.|smf-udp-pro
```

6. Accesso a Grafana

6.1 Ottenere l'URL per accedere a Grafana:

```
cisco@brusmi-master1:~$ kubectl get ingress -n cee-cee | grep grafana
grafana-ingress grafana.192.168.168.208.10.xxx.x 80, 443 6d18h
```

6.2 Aprire una pagina Web con HTTPS come indicato di seguito:

```
https://grafana.192.168.208.10.xxx.x
```

Informazioni su questa traduzione

Cisco ha tradotto questo documento utilizzando una combinazione di tecnologie automatiche e umane per offrire ai nostri utenti in tutto il mondo contenuti di supporto nella propria lingua. Si noti che anche la migliore traduzione automatica non sarà mai accurata come quella fornita da un traduttore professionista. Cisco Systems, Inc. non si assume alcuna responsabilità per l’accuratezza di queste traduzioni e consiglia di consultare sempre il documento originale in inglese (disponibile al link fornito).