

排除CNDP上的Kubernetes Pod崩潰故障

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簡介

本文說明如何對雲原生部署平台(CNDP)上的Pod崩潰進行故障排除。

必要條件

需求

本文件沒有特定需求。

採用元件

本文件所述內容不限於特定軟體和硬體版本。

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除 (預設) 的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

背景資訊

在此設定中，雲本地部署平台(CNDP)託管會話管理功能(SMF)。

問題

您會看到有關Pod崩潰的通用執行環境(CEE)的警報。

Command:

```
cee# show alerts active summary summary
```

Example:

```
[smf-rcdn/cee-rcdn] cee# show alerts active summary summary  
NAME UID SUMMARY
```

```
k8s-pod-crashing-loop bd4394046466 Pod smf-rcdn/smf-service-n0-6 (smf-service) is...
k8s-pod-crashing-loop 0ac1019911e3 Pod smf-rcdn/smf-service-n0-14 (smf-service) i...
k8s-pod-crashing-loop eeff8fa16660 Pod smf-rcdn/smf-service-n0-9 (smf-service) is...
k8s-pod-crashing-loop 470ff66822dc Pod smf-rcdn/smf-service-n0-5 (smf-service) is...
k8s-pod-crashing-loop cc8950f07ace Pod smf-rcdn/smf-service-n0-15 (smf-service) i...
k8s-pod-crashing-loop 05a7d1e291a6 Pod smf-rcdn/smf-service-n0-3 (smf-service) is...
```

分析

連線到主節點並顯示所有崩潰的kubernetes pod。以下專案的Grep: CrashLoopBackOff. 從相同的輸出中，我們可以看到此Pod重新啟動的次數。

Command:

```
master$ kubectl get pods -n
```

```
cloud-user@smf-rcdn-master-1:~$ kubectl get pods -n smf-rcdn |grep -v Running
```

NAME	READY	STATUS	RESTARTS
smf-service-n0-10 6d7h	1/2	CrashLoopBackOff	1224
smf-service-n0-11 6d7h	1/2	CrashLoopBackOff	1242
smf-service-n0-15 6d7h	1/2	CrashLoopBackOff	1244
smf-service-n0-2 6d7h	1/2	CrashLoopBackOff	1241
smf-service-n0-3 6d7h	1/2	CrashLoopBackOff	1251
smf-service-n0-5 6d7h	1/2	CrashLoopBackOff	1231
smf-service-n0-7 6d7h	1/2	CrashLoopBackOff	1249

描述墜毀的太空艙。這樣你就可以知道為什麼Pod崩潰的更多細節。觀察Events (事件) 下的日誌

o

Command:

```
master$ kubectl describe pod -n
```

```
:
```

```
cloud-user@smf-rcdn-master-1:~$ kubectl describe pod -n smf-rcdn smf-service-n0-11 |grep -i start
Start Time: Tue, 09 Aug 2022 03:13:54 +0000 Started: Tue, 09 Aug 2022 03:13:56 +0000 Restart
Count: 0 Started: Mon, 15 Aug 2022 11:33:10 +0000 Started: Mon, 15 Aug 2022 11:26:55 +0000
Restart Count: 1263 Started: Tue, 09 Aug 2022 03:13:58 +0000 Restart Count: 0 Events: Type
Reason Age From Message ---- - - - - - - - - - - - - - - - - - - - - - - Warning BackOff 65s (x15210 over 3d6h)
kubelet Back-off restarting failed container
```

例如，您有Pod smf-service-n1-0 發生故障，您需要連線到節點 smf-rcdn-service-ims2 收集核心檔案。

```
ubuntu@smf-rcdn-master1:~$ kubectl get pods -n smf-ims -o wide | grep smf-service-n1-0
```

NAME	READY	STATUS	RESTARTS	AGE	IP	NODE
NOMINDATEDN NODE	READINESS	GATES				
smf-service-n1-0	2/2	Running	10	9h	10.20.9.142	smf-rcdn-service-ims2

連線到節點是崩潰並收集二進位制檔案的主機Pod。思科分析需要此檔案。

Command:

```
master1:~$ kubectl cp
```

Example:

```
ubuntu@smf-rcdn-master1:~$ kubectl cp smf-ims/smf-service-n1-0:/opt/workspace/smf-service
/tmp/smf-service
```

Connect to the Node是崩潰的主機Pod，它轉至資料夾/var/lib/systemd/coredump/and display content。如果已生成，則可以在此資料夾中看到它們。

Example:

```
ubuntu@smf-rcdn-master1:~$ ssh smf-rcdn-service-ims2
ubuntu@smf-rcdn-service-ims2:~$ cd /var/lib/systemd/coredump/
ubuntu@smf-rcdn-service-ims2:/var/lib/systemd/coredump$ ls -ltr
total 982340
-rw-r----- 1 root root 52968460 Sep 21 16:40 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.1232.1599842408000000.lz4
-rw-r----- 1 root root 61609776 Sep 21 16:41 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.3468.1599842463000000.lz4
-rw-r----- 1 root root 74233259 Sep 21 16:46 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.28259.1599842775000000.lz4
-rw-r----- 1 root root 58241763 Sep 21 16:52 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.17155.1599843174000000.lz4
-rw-r----- 1 root root 43732684 Sep 21 16:56 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.3076.1599843385000000.lz4
-rw-r----- 1 root root 52377930 Sep 21 17:06 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.8024.1599844002000000.lz4
-rw-r----- 1 root root 63990106 Sep 21 17:07 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.26962.1599844074000000.lz4
-rw-r----- 1 root root 98058261 Sep 21 17:15 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.13026.1599844546000000.lz4
-rw-r----- 1 root root 59586871 Sep 21 17:24 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.21720.1599845052000000.lz4
-rw-r----- 1 root root 71187759 Sep 21 17:50 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.19705.1599846648000000.lz4
-rw-r----- 1 root root 96949278 Sep 21 17:57 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.11744.1599847049000000.lz4
-rw-r----- 1 root root 6052439 Sep 21 17:57 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.23846.1599847052000000.lz4
-rw-r----- 1 root root 70642243 Sep 21 17:58 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.18327.1599847110000000.lz4
-rw-r----- 1 root root 66052273 Sep 21 18:10 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.1504.1599847843000000.lz4
-rw-r----- 1 root root 65132876 Sep 21 18:10 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.12528.1599847855000000.lz4
-rw-r----- 1 root root 65000665 Sep 21 18:32 core.smf-
service.0.a829fbabe2e649a7ab02150838fe47ae.9462.1599849167000000.lz4
```

```
ubuntu@smf-rcdn-master1:~$:/var/lib/systemd/coredump$
```

Tar資料夾中的所有檔案。

```
ubuntu@smf-rcdn-service-ims2:~$ sudo tar czvfsmf-rcdn-service-ims2.tar.gz *.lz4
```

從主SFTP到核心所在的節點，並將它們下載到Master /tmp資料夾，然後將其拉到PC。

```
ubuntu@smf-rcdn-master1:~$ sftp smf-rcdn-service-ims2
```

命令會在上次Pod重新啟動之前列印日誌並捕獲崩潰簽名。

Command:

```
master:~$ kubectl logs -n
```

Example:

```
ubuntu@smf-rcdn-master1:~$ kubectl logs -n smf-ims -p smf-service-n1-0 -c smf-service
/usr/local/go/src/runtime/asm_amd64.s:1357 (0x462d01) panic: runtime error: invalid memory
address or nil pointer dereference [signal SIGSEGV: segmentation violation code=0x1 addr=0x50
pc=0x13d92f6] goroutine 839296 [running]: panic(0x196c320, 0x3441300)
/usr/local/go/src/runtime/panic.go:722 +0x2c2 fp=0xc000a9d050 sp=0xc000a9cfc0 pc=0x432d82
runtime.panicmem(...) /usr/local/go/src/runtime/panic.go:199 runtime.sigpanic()
/usr/local/go/src/runtime/signal_unix.go:394 +0x3ec fp=0xc000a9d080 sp=0xc000a9d050 pc=0x4487cc
smf-service/userplane.(*UpfServData).
```

```
ProcessSessionModificationResponse(0xc0059fe660, 0xc005b98f00, 0xc00aa6e3c0,
0x2001181ae72b892, 0xc00ea43570, 0x3, 0x4,
```

```
0xc005cd0820, 0xc005b11410, 0xc005b10d20, ...) /opt/workspace/smf-service/src/smf-
service/userplane/upfSessionModification.go:743 +0x526 fp=0xc000a9d408 sp=0xc000a9d080
pc=0x13d92f6 smf-
service/procedures/4g/pdn5g4gHo.(*Pdn5g4gHoProcedure).awtUpfModifyProcN4ModifyResp(0xc005a17440,
0xc0099e36c0, 0x0, 0x0, 0x0, 0x0, 0x0, 0x0, 0x0, 0x0) /opt/workspace/smf-service/src/smf-
service/procedures/4g/pdn5g4gHo/mbrUtils.go:485 +0x24d fp=0xc000a9d630 sp=0xc000a9d408
pc=0x1562d0d smf-
service/procedures/4g/pdn5g4gHo.(*Pdn5g4gHoProcedure).handleUpfModifyEvents(0xc005a17440,
0xc0099e36c0, 0x0, 0x0, 0x0, 0x0, 0x0, 0x0, 0x0, 0x0) /opt/workspace/smf-service/src/smf-
service/procedures/4g/pdn5g4gHo/stateHandler.go:196 +0x4a1 fp=0xc000a9d768 sp=0xc000a9d630
pc=0x1570d31 smf-service/procedures/4g/pdn5g4gHo.(*Pdn5g4gHoProcedure).HandleEvent(0xc005a17440,
0xc0099e36c0, 0x6, 0x0, 0x0, 0x0, 0x0, 0x0, 0x0, 0x0, ...) /opt/workspace/smf-service/src/smf-
service/procedures/4g/pdn5g4gHo/procedure.go:364 +0x707 fp=0xc000a9d8d0 sp=0xc000a9d768
pc=0x1567887 smf-service/vendor/wwwin-github.cisco.com/mobile-cnat-smf/smf-common.git/src/smf-
common/callflow.(*BaseProcedure).Handle(0xc00568b4a0, 0xc0099e36c0, 0x0,
0x0, 0x0, 0x0, 0x0, 0x0, 0x0) /opt/workspace/smf-service/src/smf-service/vendor/wwwin-
github.cisco.com/mobile-cnat-smf/smf-common.git/src/smf-common/callflow/BaseProcedure.go:54
+0xdb
fp=0xc000a9d978 sp=0xc000a9d8d0 pc=0xf5996b smf-service/vendor/wwwin-github.cisco.com/mobile-
cnat-smf/smf-common.git/src/smf-common/callflow.(*SessionState).ProcessContinue(0xc00b79b6d0,
0xc0099e36c0,
0xc00568b4a0, 0x0, 0x0, 0x0, 0x0, 0x0, 0x0, 0x0, ...) /opt/workspace/smf-service/src/smf-
service/vendor/wwwin-github.cisco.com/mobile-cnat-smf/smf-common.git/src/smf-
common/callflow/SessionState.go:169 +0x1f2
```

```
fp=0xc000a9da20 sp=0xc000a9d978 pc=0xf5d552 smf-
service/processor.(*SmfAppMessageProcessor).ProcessContinue(0x3a31da0, 0xc005b98f00, 0x1d34988,
0x35, 0x9, 0x1d34988, 0x35) /opt/workspace/smf-service/src/smf-
service/processor/grpc_message_processor.go:430 +0x4ab fp=0xc000a9dc20 sp=0xc000a9da20
pc=0x174fc0b smf-service/vendor/wwwin-github.cisco.com/mobile-cnat-golang-lib/app-
infra.git/src/app-infra/infra.(*masterBlueprint).processTransaction
(0xc0003141e0, 0xc005b98f00, 0xc000a9dd98) /opt/workspace/smf-service/src/smf-
service/vendor/wwwin-github.cisco.com/mobile-cnat-golang-lib/app-infra.git/src/app-
infra/infra/MasterBlueprint.go:301
+0x1a7 fp=0xc000a9dce8 sp=0xc000a9dc20 pc=0xd39ca7 smf-service/vendor/wwwin-
github.cisco.com/mobile-cnat-golang-lib/app-infra.git/src/app-infra/infra.(*masterBlueprint).
processTransactionWithCR(0xc0003141e0, 0xc005b98f00, 0x1cfeb00) /opt/workspace/smf-
service/src/smf-service/vendor/wwwin-github.cisco.com/mobile-cnat-golang-lib/app-
infra.git/src/app-infra/infra/MasterBlueprint.go:234
+0x394 fp=0xc000a9de78 sp=0xc000a9dce8 pc=0xd396e4 smf-service/vendor/wwwin-
github.cisco.com/mobile-cnat-golang-lib/app-infra.git/src/app-infra/infra.(*masterBlueprint).
processSessionTransaction(0xc0003141e0, 0xc005b98f00, 0x1, 0x0) /opt/workspace/smf-
service/src/smf-service/vendor/wwwin-github.cisco.com/mobile-cnat-golang-lib/app-
infra.git/src/app-infra/infra/MasterBlueprint.go:177
+0x124 fp=0xc000a9ded0 sp=0xc000a9de78 pc=0xd39104 smf-service/vendor/wwwin-
github.cisco.com/mobile-cnat-golang-lib/app-infra.git/src/app-infra/infra.(*masterBlueprint).
processEvent(0xc0003141e0, 0xc005b98f00, 0x1d02487) /opt/workspace/smf-service/src/smf-
service/vendor/wwwin-github.cisco.com/mobile-cnat-golang-lib/app-infra.git/src/app-
infra/infra/MasterBlueprint.go:138 +0x5fc
fp=0xc000a9df88 sp=0xc000a9ded0 pc=0xd3869c smf-service/vendor/wwwin-github.cisco.com/mobile-
cnat-golang-lib/app-infra.git/src/app-infra/infra.(*ApplicationContext).NewTransaction.func2
(0xc0006af400, 0xc005b98f00) /opt/workspace/smf-service/src/smf-service/vendor/wwwin-
github.cisco.com/mobile-cnat-golang-lib/app-infra.git/src/app-
infra/infra/ApplicationContext.go:1268
+0x7c fp=0xc000a9dfd0 sp=0xc000a9df88 pc=0xd9b69c runtime.goexit()
/usr/local/go/src/runtime/asm_amd64.s:1357 +0x1 fp=0xc000a9dfd8 sp=0xc000a9dfd0 pc=0x462d01
created by smf-service/vendor/wwwin-github.cisco.com/mobile-cnat-golang-lib/app-
infra.git/src/app-infra/infra.(*ApplicationContext).NewTransaction /opt/workspace/smf-
service/src/smf-service/vendor/wwwin-github.cisco.com/mobile-cnat-golang-lib/app-
infra.git/src/app-infra/infra/ApplicationContext.go:1266 +0x62c goroutine 1 [sleep]:
runtime.gopark(0x1dbaa10, 0x34ef580, 0xc001f01313, 0x2) /usr/local/go/src/runtime/proc.go:304
+0xe0 fp=0xc000a3bca8 sp=0xc000a3bc88 pc=0x434ea0 runtime.goparkunlock(...)
```

在Pod崩潰之前和之後連線到CEE並收集tac-debug。

tac-debug-pkg create from yyyy-mm-dd_hh:mm:ss to yyyy-mm-dd_hh:mm:ss tac-debug-pkg create from yyyy-mm-dd_hh:mm:ss to yyyy-mm-dd_hh:mm:ss

行動計畫

[開啟Cisco TAC](#)的服務請求以查詢此崩潰的根本原因。

關於此翻譯

思科已使用電腦和人工技術翻譯本文件，讓全世界的使用者能夠以自己的語言理解支援內容。請注意，即使是最佳機器翻譯，也不如專業譯者翻譯的內容準確。Cisco Systems, Inc. 對這些翻譯的準確度概不負責，並建議一律查看原始英文文件（提供連結）。