

ImagePullBackOff 상태의 레지스트리 네임스페이스 Pod 문제 해결

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소개

이 문서에서는 ImagePullBackOff 상태의 레지스트리 포드의 문제 및 해결 방법을 설명합니다.

문제

Ultra Cloud Core Subscriber Microservices Infrastructure(SMI)의 클러스터 관리자(CM)에 있는 레지스트리 포드는 ImagePullBackOff 상태입니다.

```
cloud-user@lab-deployer-cm-primary:~$ kubectl get pods -A -o wide | grep -v "Running"
NAMESPACE          NAME                                READY
STATUS             RESTARTS   AGE    IP              NODE                                NOMINATED NODE
READINESS GATES
registry           charts-cee-2020-02-2-1-1-0          0/1
ImagePullBackOff  0          100d   10.10.10.178    lab-deployer-cm-primary           <none>
<none>
registry           charts-cluster-deployer-2020-02-2-35-0 0/1
ImagePullBackOff  0          100d   10.10.10.180    lab-deployer-cm-primary           <none>
<none>
registry           registry-cee-2020-02-2-1-1-0        0/1
ImagePullBackOff  0          100d   10.10.10.198    lab-deployer-cm-primary           <none>
<none>
registry           registry-cluster-deployer-2020-02-2-35-0 0/1
ImagePullBackOff  0          100d   10.10.10.152    lab-deployer-cm-primary           <none>
<none>
registry           software-unpacker-0                 0/1
ImagePullBackOff  0          100d   10.10.10.160    lab-deployer-cm-primary           <none>
<none>
```

CEE(Common Execution Environment) Deployer는 보류 중인 시스템 동기화가 true이므로 시스템 준비 상태의 0%를 표시합니다.

```
[deployer/cee] cee# show system
system uuid 012345678-9abc-0123-4567-000011112222
system status deployed true
system status percent-ready 0.0
system ops-center repository https://charts.10.192.1.1.nip.io/cee-2020.02.2.35
system ops-center-debug status false
system synch running true
system synch pending true.
```

SSH(Secure Shell Protocol)를 사용하여 CEE에 연결하면 404 Not Found 오류가 보고됩니다.

```

[deployer/cee] cee#
Message from confd-api-manager at 2022-05-05 01:01:01...
Helm update is ERROR. Trigger for update is CHANGE. Message is:
WebApplicationException: HTTP 404 Not Found
com.google.common.util.concurrent.UncheckedExecutionException:
javax.ws.rs.WebApplicationException: HTTP 404 Not Found
at com.google.common.cache.LocalCache$Segment.get(LocalCache.java:2052)
at com.google.common.cache.LocalCache.get(LocalCache.java:3943)
at com.google.common.cache.LocalCache.getOrLoad(LocalCache.java:3967)
at com.google.common.cache.LocalCache$LocalLoadingCache.get(LocalCache.java:4952)
at
com.broadhop.conf.d.config.proxy.dao.HelmRepositoryDAO.getChartVersion(HelmRepositoryDAO.java:638
)
at
com.broadhop.conf.d.config.proxy.dao.HelmRepositoryDAO.installRelease(HelmRepositoryDAO.java:359)
at
com.broadhop.conf.d.config.proxy.dao.HelmRepositoryDAO.sendConfiguration(HelmRepositoryDAO.java:2
54)
at
com.broadhop.conf.d.config.proxy.service.ConfigurationSynchManager.run(ConfigurationSynchManager.
java:233)
at java.util.concurrent.Executors$RunnableAdapter.call(Executors.java:511)
at java.util.concurrent.FutureTask.runAndReset(FutureTask.java:308)
at
java.util.concurrent.ScheduledThreadPoolExecutor$ScheduledFutureTask.access$301(ScheduledThreadP
oolExecutor.java:180)
at
java.util.concurrent.ScheduledThreadPoolExecutor$ScheduledFutureTask.run(ScheduledThreadPoolExec
utor.java:294)
at java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1149)
at java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:624)
at java.lang.Thread.run(Thread.java:748)
Caused by: javax.ws.rs.WebApplicationException: HTTP 404 Not Found
at
com.broadhop.conf.d.config.proxy.dao.HelmRepositoryDAO.retrieveHelmIndex(HelmRepositoryDAO.java:6
20)
at com.broadhop.conf.d.config.proxy.dao.HelmRepositoryDAO$2.load(HelmRepositoryDAO.java:114)
at com.broadhop.conf.d.config.proxy.dao.HelmRepositoryDAO$2.load(HelmRepositoryDAO.java:112)
at com.google.common.cache.LocalCache$LoadingValueReference.loadFuture(LocalCache.java:3524)
at com.google.common.cache.LocalCache$Segment.loadSync(LocalCache.java:2273)
at com.google.common.cache.LocalCache$Segment.lockedGetOrLoad(LocalCache.java:2156)
at com.google.common.cache.LocalCache$Segment.get(LocalCache.java:2046)

```

분석

1. CEE Deployer에서 repository configuration 키를 선택합니다.

```

[deployer/cee] cee# show running-config helm
helm default-repository base-repos
helm repository base-repos
url https://charts.10.192.1.1.nip.io/cee-2020.02.2.35
exit

```

2. 기본 클러스터 관리자에서 url의 index.yaml을 쿼리하여 404 응답이 전송되는지 확인합니다.

```

cloud-user@deployer-cm-primary:~$ curl -k https://charts.10.192.1.1.nip.io/cee-2020.02.2.35/index.yaml
default backend - 404

```

3. 쿼리 이미지 목록 `kubectl describe pod` 명령을 실행합니다. 설명 오류에 기반한 이미지가 없습니다.

```

cloud-user@lab-deployer-cm-primary:~$ kubectl describe pod ops-center-cee-labcluster-ops-
center-df69975c7-gzszg -n cee-labcluster | grep Image
Image: docker.10.192.1.1.nip.io/cee-2020.02.2.35/smi-apps/cee-ops-

```

```
center/2020.02.2/confd_init:0.7.0-00001111
Image ID: docker-pullable://docker.10.192.1.1.nip.io/cee-2020.02.2.33/smi-apps/cee-ops-
center/2020.02.2/confd_init@sha256:01234567890123456789012345678901234567890123456789012345
67890123
Image: docker.10.192.1.1.nip.io/cee-2020.02.2.35/smi-libraries/ops-
center/2020.02.2/crd_registry:0.7.1-00002222
Image ID: docker-pullable://docker.10.192.1.1.nip.io/cee-2020.02.2.27/smi-libraries/ops-
center/2020.02.2/crd_registry@sha256:012345678901234567890123456789012345678901234567890123
4567890123
Image: docker.10.192.1.1.nip.io/cee-2020.02.2.35/smi-libraries/ops-
center/2020.02.2/local_storage_init:0.7.1-00003333
Image ID: docker-pullable://docker.10.192.1.1.nip.io/cee-2020.02.2.27/smi-libraries/ops-
center/2020.02.2/local_storage_init@sha256:012345678901234567890123456789012345678901234567
8901234567890123
Image: docker.10.192.1.1.nip.io/cee-2020.02.2.35/smi-libraries/ops-
center/2020.02.2/confd:0.7.1-00004444
Image ID: docker-pullable://docker.10.192.1.1.nip.io/cee-2020.02.2.27/smi-libraries/ops-
center/2020.02.2/confd@sha256:0123456789012345678901234567890123456789012345678901234567890
123
Image: docker.10.192.1.1.nip.io/cee-2020.02.2.35/smi-libraries/ops-
center/2020.02.2/confd_api_bridge:0.7.1-00005555
Image ID: docker-pullable://docker.10.192.1.1.nip.io/cee-2020.02.2.33/smi-libraries/ops-
center/2020.02.2/confd_api_bridge@sha256:01234567890123456789012345678901234567890123456789
01234567890123
Image: docker.10.192.1.1.nip.io/cee-2020.02.2.35/smi-apps/cee-ops-
center/2020.02.2/product_confid_callback:0.7.0-00006666
Image ID: docker-pullable://docker.10.192.1.1.nip.io/cee-2020.02.2.27/smi-apps/cee-ops-
center/2020.02.2/product_confid_callback@sha256:01234567890123456789012345678901234567890123
45678901234567890123
Image: docker.10.192.1.1.nip.io/cee-2020.02.2.35/smi-libraries/ops-
center/2020.02.2/ssh_ui:0.7.1-00007777
Image ID: docker-pullable://docker.10.192.1.1.nip.io/cee-2020.02.2.35/smi-libraries/ops-
center/2020.02.2/ssh_ui@sha256:012345678901234567890123456789012345678901234567890123456789
0123
Image: docker.10.192.1.1.nip.io/cee-2020.02.2.35/smi-libraries/ops-
center/2020.02.2/confd_notifications:0.7.1-00008888
Image ID: docker-pullable://docker.10.192.1.1.nip.io/cee-2020.02.2.27/smi-libraries/ops-
center/2020.02.2/confd_notifications@sha256:01234567890123456789012345678901234567890123456
78901234567890123
```

4. 실행 `kubectl describe pod name state` 레지스트리에 대한 명령입니다.
5. 실행 `kubectl get pods -A -o wide | grep -v "Running"` 명령을 사용하여 Kubernetes 클러스터의 모든 네임스페이스에서 포드의 상태를 확인합니다.

```
cloud-user@lab-deployer-cm-primary:~$ kubectl describe pod charts-cee-2020-02-2-1-1-0 -n registry
```

```
Volumes:
charts-volume:
Type: HostPath (bare host directory volume)
Path: /data/software/packages/cee-2020.02.2.1.1/data/charts
HostPathType: DirectoryOrCreate
Events:
Type Reason Age From Message
-----
Normal BackOff 9m3s (x104861 over 16d) kubelet Back-off pulling image
"dockerhub.cisco.com/smi-fuse-docker-internal/smi-apps/distributed-
registry/2020.02.2/apache:0.1.0-abcd123"
Warning Failed 3m59s (x104884 over 16d) kubelet Error: ImagePullBackOff
```

```
cloud-user@lab-deployer-cm-primary:$ kubectl describe pod charts-cluster-deployer-2020-02-2-35-0 -n registry
Name: charts-cluster-deployer-2020-02-2-35-0
Namespace: registry
Priority: 1000000000
Priority Class Name: infra-critical
```

```

Node: lab-deployer-cm-primary/10.192.1.1
Start Time: Thu, 01 Jan 2022 13:05:03 +0000
Labels: chart-app=charts-cluster-deployer-2020-02-2-35
component=charts
controller-revision-hash=charts-cluster-deployer-2020-02-2-35-589fdf57b8
registry=cluster-deployer-2020.02.2.35
statefulset.kubernetes.io/pod-name=charts-cluster-deployer-2020-02-2-35-0
Annotations: cni.projectcalico.org/podIP: 10.10.10.180/32
cni.projectcalico.org/podIPs: 10.10.10.180/32
sidecar.istio.io/inject: false
Status: Pending
IP: 10.10.10.180
IPs:
IP: 10.10.10.180
Controlled By: StatefulSet/charts-cluster-deployer-2020-02-2-35
Containers:
charts:
Container ID:
Image: dockerhub.cisco.com/smi-fuse-docker-internal/smi-apps/distributed-registry/2020.02.2/apache:0.1.0-abcd123
Image ID:
Port: 8080/TCP
Host Port: 0/TCP
State: Waiting
Reason: ImagePullBackOff
Ready: False
Restart Count: 0
Environment: <none>
Mounts:
/var/run/secrets/kubernetes.io/serviceaccount from default-token-qcmhx (ro)
/var/www/html/cluster-deployer-2020.02.2.35 from charts-volume (rw)
Conditions:
Type Status
Initialized True
Ready False
ContainersReady False
PodScheduled True
Volumes:
charts-volume:
Type: HostPath (bare host directory volume)
Path: /data/software/packages/cluster-deployer-2020.02.2.35/data/charts
HostPathType: DirectoryOrCreate
default-token-qcmhx:
Type: Secret (a volume populated by a Secret)
SecretName: default-token-qcmhx
Optional: false
QoS Class: BestEffort
Node-Selectors: <none>
Tolerations: node.kubernetes.io/not-ready:NoExecute op=Exists for 30s
node.kubernetes.io/unreachable:NoExecute op=Exists for 30s
Events:
Type Reason Age From Message
-----
Normal BackOff 118s (x104949 over 16d) kubelet Back-off pulling image
"dockerhub.cisco.com/smi-fuse-docker-internal/smi-apps/distributed-registry/2020.02.2/apache:0.1.0-abcd123"

cloud-user@lab-deployer-cm-primary: /data/software/packages/cluster-deployer-2020.02.2.35/data/charts$
cloud-user@lab-deployer-cm-primary: $ kubectl get pods -A -o wide | grep -v "Running"
NAMESPACE NAME READY STATUS RESTARTS AGE IP NODE NOMINATED NODE READINESS GATES
registry charts-cee-2020-02-2-1-1-0 0/1 ImagePullBackOff 0 100d 10.10.10.178 lab-deployer-cm-primary <none> <none>
registry charts-cluster-deployer-2020-02-2-35-0 0/1 ErrImagePull 0 100d 10.10.10.180 lab-

```

```

deployer-cm-primary <none> <none>
registry registry-cee-2020-02-2-1-1-0 0/1 ErrImagePull 0 100d 10.10.10.198 lab-deployer-cm-
primary <none> <none>
registry registry-cluster-deployer-2020-02-2-35-0 0/1 ImagePullBackOff 0 100d 10.10.10.152
lab-deployer-cm-primary <none> <none>
registry software-unpacker-0 0/1 ImagePullBackOff 0 100d 10.10.10.160 lab-deployer-cm-
primary <none> <none>

```

6. 클러스터 배포자의 파일을 확인합니다.

```

cloud-user@lab-deployer-cm-primary:/data/software/packages$ cd cluster-deployer-
2020.02.2.35/
cloud-user@lab-deployer-cm-primary:/data/software/packages/cluster-deployer-2020.02.2.35$
ll
total 12
drwxrwxr-x 3 303 303 4096 Jan 1 2021 ./
drwxrwxrwt 5 root root 4096 Mar 1 11:39 ../
drwxrwxr-x 5 303 303 4096 Jan 1 2021 data/
cloud-user@lab-deployer-cm-primary:/data/software/packages/cluster-deployer-2020.02.2.35$
cd data/
cloud-user@lab-deployer-cm-primary:/data/software/packages/cluster-deployer-
2020.02.2.35/data$ ll
total 20
drwxrwxr-x 5 303 303 4096 Jan 1 2021 ./
drwxrwxr-x 3 303 303 4096 Jan 1 2021 ../
drwxr-xr-x 2 303 303 4096 Mar 1 12:55 charts/
drwxr-xr-x 4 303 303 4096 Aug 10 2021 deployer-inception/
drwxr-xr-x 3 303 303 4096 Aug 10 2021 docker/
cloud-user@lab-deployer-cm-primary:/data/software/packages/cluster-deployer-
2020.02.2.35/data$ cd charts/
cloud-user@lab-deployer-cm-primary:/data/software/packages/cluster-deployer-
2020.02.2.35/data/charts$ ll
total 116
drwxr-xr-x 2 303 303 4096 Mar 1 12:55 ./
drwxrwxr-x 5 303 303 4096 Jan 1 2021 ../
-rw-r--r-- 1 303 303 486 Aug 10 2021 index.yaml
-rw-r--r-- 1 303 303 102968 Mar 1 12:55 smi-cluster-deployer-1.1.0-2020-02-2-1144-
210826141421-15f3d5b.tgz
cloud-user@lab-deployer-cm-primary:/tmp$
cloud-user@lab-deployer-cm-primary:/tmp$ ls /tmp/k8s-* -al
-rw-r--r-- 1 root root 2672 Sep 7 2021 /tmp/k8s-offline.tgz.txt

```

솔루션

이 문제는 클러스터 동기화 실패로 인해 발생한 것으로 간주됩니다. 해결 방법은 Inception 서버에서 CM HA(고가용성)로의 클러스터 동기화를 실행하는 것입니다.

1. SSH를 사용하여 검사 서버에 연결합니다.
2. SSH를 사용하여 운영 센터 포트 2022에 연결합니다.

```
cloud-user@all-in-one-vm:~$ ssh admin@localhost -p 2022
```

3. 클러스터가 Inception 서버에 있는지 확인합니다.

```
[all-in-one-base-vm] SMI Cluster Deployer# show clusters
```

4. 클러스터의 컨피그레이션이 올바른지 확인하고 확인합니다. 이 예에서 클러스터 이름은 lab-deployer입니다.

```
[all-in-one-base-vm] SMI Cluster Deployer# show running-config clusters lab-deployer
```

5. 클러스터 동기화를 실행합니다.

```
[all-in-one-base-vm] SMI Cluster Deployer# clusters lab-deployer actions sync run debug
```

6. 동기화 로그를 모니터링합니다.

```
[all-in-one-base-vm] SMI Cluster Deployer# monitor sync-logs lab-deployer
```

Successful cluster sync logs example below :

```
Wednesday 01 December 2021 01:01:01 +0000 (0:00:00.080) 0:33:08.600 ****
```

```
=====
```

```
2021-12-01 01:01:01.230 DEBUG cluster_sync.ca-deployer: Cluster sync successful
```

```
2021-12-01 01:01:01.230 DEBUG cluster_sync.ca-deployer: Ansible sync done
```

```
2021-12-01 01:01:01.231 INFO cluster_sync.ca-deployer: _sync finished. Opening lock
```

7. SSH를 사용하여 클러스터 관리자에 연결하고 포드가 "실행 중" 상태인지 확인합니다.

```
cloud-user@lab-deployer-cm-primary:~$ kubectl get pods -A -o wide | grep -v "Running"
```

이 번역에 관하여

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