

Software Upgrade using Site Isolation Procedure

- Feature Summary and Revision History, on page 1
- Feature Description, on page 2
- Prerequisites, on page 2
- Pre-upgrade Backup Steps, on page 2
- Post-Upgrade Verification Steps, on page 10
- Admin DB replica set for cross-cluster sharing, on page 13

Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Products or Functional Area	PCF
Applicable Platform(s)	SMI
Feature Default Setting	Enabled - Always-on
Related Documentation	Not Applicable

Revision History

Table 2: Revision History

Revision Details	Release
First introduced.	2023.02.0

Feature Description

The PCF supports the base images of all containers from the Ubuntu and Mongo versions, which got updated from 20.04 to 18.04 for the Ubuntu version and from 4.4 to the 4.0 version for Mongo containers. The Software Upgrade using Site Isolation Procedure requires the site isolation and a method of procedures for execution during the maintenance window considering the upgrade path. The in-service updates aren't supported because there's no upgrade from Mongo 4.0 to 4.4.

Prerequisites

Ensure that the PCF system runs with the Pre April 2023 PCF release version.

Pre-upgrade Backup Steps

Procedure

Step 1 To start the upgrade, log in to the SMI Cluster Manager node as an Ubuntu user and verify all the pods and nodes are operational.

```
# SSh to Master node and if not all the pods and nodes are running please don't not proceed

cloud-user@pcf-cm-node-master-1:~$ kubectl get nodes -A
NAME                   STATUS   ROLES           AGE     VERSION
pcf-cm-node-master-1   Ready    control-plane   6d15h   v1.24.6
pcf-cm-node-master-2   Ready    control-plane   6d14h   v1.24.6
pcf-cm-node-master-3   Ready    control-plane   6d14h   v1.24.6
pcf-cm-node-worker-1   Ready    <none>          6d14h   v1.24.6

cloud-user@pcf-cm-node-master-1:~$ kubectl get pods -A
NAMESPACE         NAME                                                              READY   STATUS
   RESTARTS        AGE
cee-cee-pcf       alert-logger-6bc6fd558d-mw6ch                                     1/1     Running
   0               5d16h
cee-cee-pcf       alert-router-7c5c6576b8-jvc6h                                     1/1     Running
   0               5d16h
cee-cee-pcf       alertmanager-0                                                    2/2     Running
   0               5d16h
cee-cee-pcf       alertmanager-1                                                    2/2     Running
   0               5d16h
cee-cee-pcf       alertmanager-2                                                    2/2     Running
   0               5d16h
cee-cee-pcf       alertmanager-config-sync-c9fcf48bd-r44bv                          1/1     Running
   0               5d16h
cee-cee-pcf       blackbox-exporter-blq6p                                           1/1     Running
   0               5d16h
cee-cee-pcf       blackbox-exporter-dh76h                                           1/1     Running
   0               5d16h
cee-cee-pcf       blackbox-exporter-l9xhw                                           1/1     Running
   0               5d16h
cee-cee-pcf       bulk-stats-0                                                      3/3     Running
   0               5d16h
cee-cee-pcf       bulk-stats-1                                                      3/3     Running
```

```
   0              5d16h
cee-cee-pcf       cee-cee-pcf-product-documentation-547fd88785-zxd7h               2/2     Running
   0              5d16h
cee-cee-pcf       core-retriever-d2znn                                            2/2     Running
   0              5d16h
cee-cee-pcf       core-retriever-gm9dl                                            2/2     Running
   0              5d16h
cee-cee-pcf       core-retriever-hn65w                                            2/2     Running
   0              5d16h
pcf-ims           db-balance1-1                                                   1/1     Running
   0              14h
pcf-ims           db-balance1-2                                                   1/1     Running
   0              14h
pcf-ims           db-spr-config-0                                                 1/1     Running
   0              14h
pcf-ims           db-spr-config-1                                                 1/1     Running
   0              14h
pcf-ims           db-spr-config-2                                                 1/1     Running
   0              14h
pcf-ims           redis-keystore-0                                                2/2     Running
   0              14h
pcf-ims           redis-keystore-1                                                2/2     Running
   0              14h
pcf-ims           redis-queue-0                                                   2/2     Running
   0              14h
pcf-ims           zookeeper-1                                                     1/1     Running
   0              14h
pcf-ims           zookeeper-2                                                     1/1     Running
   0              14h
registry          charts-cee-2023-01-1-i20-0                                      1/1     Running
   0              6d
registry          charts-cee-2023-01-1-i20-1                                      1/1     Running
   0              6d
registry          charts-cee-2023-01-1-i20-2                                      1/1     Running
   0              6d
1/1     Running   0              6d14h
registry          software-unpacker-2                                             1/1     Running
   0              6d15h
smi-certs         ss-cert-provisioner-6cb559cf57-9rzzk                            1/1     Running
   0              6d15h
smi-ops-control   opscenter-controller-647df69568-np6ql                           1/1     Running
   0              6d15h
smi-vips          keepalived-l57sc                                                3/3     Running
   0              6d14h
smi-vips          keepalived-ls7mr                                                3/3     Running
   11             36d
smi-vips          keepalived-qssvm                                                3/3     Running
   18             36d
smi-vips          keepalived-v9fbl                                                3/3     Running
   8              36d

# Should be no output from the command below:
cloud-user@pcf-cm-node-master-1:~$ kubectl get pods -A | grep 0/

# Should be no output from the command below:
cloud-user@pcf-cm-node-master-1:~$ kubectl get pods -A | grep -v Running
NAMESPACE         NAME                                                            READY   STATUS
   RESTARTS        AGE


# Verify Current version of the CEE and PCF and ensure the software is with pre-April release:

cloud-user@pcf-cm-node-master-1:~$ helm ls -n pcf-ims
NAME                                NAMESPACE       REVISION        UPDATED
```

```
            STATUS          CHART                                                                  APP
VERSION
pcf-ims-cnat-cps-infrastructure         pcf-ims         1               2023-02-22 17:58:35.144604765
 +0000 UTC deployed        cnat-cps-infrastructure-0.6.10-main-0045-230214110634-13d42ee
BUILD_2023.02.m0.i18
pcf-ims-cps-diameter-ep-rx-protocol-1   pcf-ims         1               2023-02-22 17:58:35.145251077
 +0000 UTC deployed        cps-diameter-ep-0.6.43-main-0399-230207041116-a31a488
BUILD_2023.02.m0.i18
pcf-ims-cps-ldap-ep                     pcf-ims         1               2023-02-22 17:58:35.034167458
 +0000 UTC deployed        cps-ldap-ep-0.8.13-main-0612-230208043335-ad5f65d
BUILD_2023.02.m0.i18
pcf-ims-etcd-cluster                    pcf-ims         1               2023-02-22 17:58:35.139498443
 +0000 UTC deployed        etcd-cluster-1.4.0-1-4-0130-221017070357-25906ad
BUILD_2023.02.m0.i18
pcf-ims-network-query                   pcf-ims         1               2023-02-22 17:58:35.121107291
 +0000 UTC deployed        network-query-0.5.4-main-0057-230206125913-ed3642a
BUILD_2023.02.m0.i18
pcf-ims-ngn-datastore                   pcf-ims         1               2023-02-22 17:58:35.139994348
 +0000 UTC deployed        ngn-datastore-1.10.0-1-10-0997-230210092614-c6b6164
BUILD_2023.02.m0.i18
pcf-ims-ops-center                      pcf-ims         15              2023-02-22 10:55:58.982801266
 +0000 UTC deployed        pcf-ops-center-0.6.32-main-0445-230221061642-374d10a
BUILD_2023.02.m0.i18
pcf-ims-pcf-config                      pcf-ims         1               2023-02-22 17:58:35.151228581
 +0000 UTC deployed        pcf-config-0.6.3-main-0021-221221114706-77d0a10
BUILD_2023.02.m0.i18
pcf-ims-pcf-dashboard                   pcf-ims         1               2023-02-22 17:58:35.152400298
 +0000 UTC deployed        pcf-dashboard-0.2.17-main-0136-221005221847-13bfa13
BUILD_2023.02.m0.i18
pcf-ims-pcf-engine-app-production       pcf-ims         1               2023-02-22 17:58:35.125468923
 +0000 UTC deployed        pcf-engine-app-0.8.16-main-0424-230208043521-b26d906
BUILD_2023.02.m0.i18
pcf-ims-pcf-ldapserver-ep               pcf-ims         1               2023-02-22 17:58:35.152091423
 +0000 UTC deployed        pcf-ldapserver-ep-0.1.8-main-0080-221220155902-e80a62f
BUILD_2023.02.m0.i18
pcf-ims-pcf-oam-app                     pcf-ims         1               2023-02-22 17:58:35.154061042
 +0000 UTC deployed        pcf-oam-app-0.6.2-main-0015-230206125249-2118fad
BUILD_2023.02.m0.i18
pcf-ims-pcf-rest-ep                     pcf-ims         1               2023-02-22 17:58:35.136755614
 +0000 UTC deployed        pcf-rest-ep-0.7.46-main-0960-230118121105-2fd07f9
BUILD_2023.02.m0.i18
pcf-ims-pcf-services                    pcf-ims         1               2023-02-22 17:58:35.146493569
 +0000 UTC deployed        pcf-services-0.6.17-main-0074-221221114612-90ebedc
BUILD_2023.02.m0.i18
```

Step 2 Collect and backup the Mongo data from the db-admin pods primary members.

a) Collect the names of the Mongo admin pods.

```
cloud-user@pcf-cm-node-master-1:~$ kubectl get pods -n pcf-ims | grep db-admin
db-admin-0                                                        1/1     Running   0
  13h
db-admin-1                                                        1/1     Running   0
  13h
db-admin-2                                                        1/1     Running   0
  13h
db-admin-config-0                                                 1/1     Running   0
  13h
db-admin-config-1                                                 1/1     Running   0
  13h
db-admin-config-2                                                 1/1     Running   0
  13h
```

b) Log in to the db-admin pod to acquire access to the primary pod member.

```
cloud-user@pcf-cm-node-master-1:~$ kubectl exec -it db-admin-0 -n pcf-ims bash
kubectl exec [POD] [COMMAND] is DEPRECATED and will be removed in a future version. Use kubectl
exec [POD] -- [COMMAND] instead.
Defaulted container "mongo" out of: mongo, cleanup (init)
groups: cannot find name for group ID 303

# Login to mongo prompt

I have no name!@db-admin-0:/$ mongo
MongoDB shell version v4.0.2
connecting to: mongodb://127.0.0.1:27017/?compressors=disabled&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("fa2ee0ae-fcc3-45f4-80f4-f1658dd3297c") }
MongoDB server version: 4.0.2
Welcome to the MongoDB shell.

# Get the primary pod member using rs.status() command
admin:SECONDARY> rs.status()
{
        "set" : "admin",
        "date" : ISODate("2023-02-23T08:52:22.268Z"),
        "myState" : 2,
        "term" : NumberLong(3),
        "syncSourceHost" : "mongo-admin-2:27017",
        "syncSourceId" : 3,
        "heartbeatIntervalMillis" : NumberLong(300),
        "majorityVoteCount" : 2,
        "writeMajorityCount" : 2,
        "votingMembersCount" : 3,
        "writableVotingMembersCount" : 3,
        "optimes" : {
                "lastCommittedOpTime" : {
                        "ts" : Timestamp(1677142340, 1),
                        "t" : NumberLong(3)
                },
                "lastCommittedWallTime" : ISODate("2023-02-23T08:52:20.219Z"),
                "readConcernMajorityOpTime" : {
                        "ts" : Timestamp(1677142340, 1),
                        "t" : NumberLong(3)
                },
                "readConcernMajorityWallTime" : ISODate("2023-02-23T08:52:20.219Z"),
                "appliedOpTime" : {
                        "ts" : Timestamp(1677142340, 1),
                        "t" : NumberLong(3)
                },
                "durableOpTime" : {
                        "ts" : Timestamp(1677142340, 1),
                        "t" : NumberLong(3)
                },
                "lastAppliedWallTime" : ISODate("2023-02-23T08:52:20.219Z"),
                "lastDurableWallTime" : ISODate("2023-02-23T08:52:20.219Z")
        },
        "lastStableRecoveryTimestamp" : Timestamp(1677142310, 1),
        "electionParticipantMetrics" : {
                "votedForCandidate" : true,
                "electionTerm" : NumberLong(3),
                "lastVoteDate" : ISODate("2023-02-22T17:59:58.482Z"),
                "electionCandidateMemberId" : 3,
                "voteReason" : "",
                "lastAppliedOpTimeAtElection" : {
                        "ts" : Timestamp(1677088640, 1),
                        "t" : NumberLong(2)
                },
                "maxAppliedOpTimeInSet" : {
                        "ts" : Timestamp(1677088640, 1),
```

```
                        "t" : NumberLong(2)
                },
                "priorityAtElection" : 1,
                "newTermStartDate" : ISODate("2023-02-22T17:59:58.492Z"),
                "newTermAppliedDate" : ISODate("2023-02-22T17:59:59.463Z")
        },
        "members" : [
                {
                        "_id" : 1,
                        "name" : "mongo-admin-0:27017",
                        "health" : 1,
                        "state" : 2,
                        "stateStr" : "SECONDARY",
                        "uptime" : 53558,
                        "optime" : {
                                "ts" : Timestamp(1677142340, 1),
                                "t" : NumberLong(3)
                        },
                        "optimeDate" : ISODate("2023-02-23T08:52:20Z"),
                        "lastAppliedWallTime" : ISODate("2023-02-23T08:52:20.219Z"),
                        "lastDurableWallTime" : ISODate("2023-02-23T08:52:20.219Z"),
                        "syncSourceHost" : "mongo-admin-2:27017",
                        "syncSourceId" : 3,
                        "infoMessage" : "",
                        "configVersion" : 3,
                        "configTerm" : 3,
                        "self" : true,
                        "lastHeartbeatMessage" : ""
                },
                {
                        "_id" : 2,
                        "name" : "mongo-admin-1:27017",
                        "health" : 1,
                        "state" : 2,
                        "stateStr" : "SECONDARY",
                        "uptime" : 53543,
                        "optime" : {
                                "ts" : Timestamp(1677142340, 1),
                                "t" : NumberLong(3)
                        },
                        "optimeDurable" : {
                                "ts" : Timestamp(1677142340, 1),
                                "t" : NumberLong(3)
                        },
                        "optimeDate" : ISODate("2023-02-23T08:52:20Z"),
                        "optimeDurableDate" : ISODate("2023-02-23T08:52:20Z"),
                        "lastAppliedWallTime" : ISODate("2023-02-23T08:52:20.219Z"),
                        "lastDurableWallTime" : ISODate("2023-02-23T08:52:20.219Z"),
                        "lastHeartbeat" : ISODate("2023-02-23T08:52:22.266Z"),
                        "lastHeartbeatRecv" : ISODate("2023-02-23T08:52:22.265Z"),
                        "pingMs" : NumberLong(0),
                        "lastHeartbeatMessage" : "",
                        "syncSourceHost" : "mongo-admin-2:27017",
                        "syncSourceId" : 3,
                        "infoMessage" : "",
                        "configVersion" : 3,
                        "configTerm" : 3
                },
                {
                        "_id" : 3,
                        "name" : "mongo-admin-2:27017",
                        "health" : 1,
                        "state" : 1,
                        "stateStr" : "PRIMARY",
```

```
                        "uptime" : 53543,
                        "optime" : {
                                "ts" : Timestamp(1677142340, 1),
                                "t" : NumberLong(3)
                        },
                        "optimeDurable" : {
                                "ts" : Timestamp(1677142340, 1),
                                "t" : NumberLong(3)
                        },
                        "optimeDate" : ISODate("2023-02-23T08:52:20Z"),
                        "optimeDurableDate" : ISODate("2023-02-23T08:52:20Z"),
                        "lastAppliedWallTime" : ISODate("2023-02-23T08:52:20.219Z"),
                        "lastDurableWallTime" : ISODate("2023-02-23T08:52:20.219Z"),
                        "lastHeartbeat" : ISODate("2023-02-23T08:52:22.266Z"),
                        "lastHeartbeatRecv" : ISODate("2023-02-23T08:52:22.148Z"),
                        "pingMs" : NumberLong(0),
                        "lastHeartbeatMessage" : "",
                        "syncSourceHost" : "",
                        "syncSourceId" : -1,
                        "infoMessage" : "",
                        "electionTime" : Timestamp(1677088798, 1),
                        "electionDate" : ISODate("2023-02-22T17:59:58Z"),
                        "configVersion" : 3,
                        "configTerm" : 3
                }
        ],
        "ok" : 1,
        "$gleStats" : {
                "lastOpTime" : Timestamp(0, 0),
                "electionId" : ObjectId("000000000000000000000000")
        },
        "lastCommittedOpTime" : Timestamp(1677142340, 1),
        "$configServerState" : {
                "opTime" : {
                        "ts" : Timestamp(1677142326, 3),
                        "t" : NumberLong(5)
                }
        },
        "$clusterTime" : {
                "clusterTime" : Timestamp(1677142340, 1),
                "signature" : {
                        "hash" : BinData(0,"AAAAAAAAAAAAAAAAAAAAAAAAAAA="),
                        "keyId" : NumberLong(0)
                }
        },
        "operationTime" : Timestamp(1677142340, 1)
}
admin:SECONDARY>

Note:- In the above output primary pod is db-admin-2
```

c) Log in to the primary db-admin pod and take the dump of data and create the tar file out of the dump.

```
cloud-user@pcf-cm-node-master-1:~$ kubectl exec -it db-admin-2 -n pcf-ims bash
kubectl exec [POD] [COMMAND] is DEPRECATED and will be removed in a future version. Use kubectl
exec [POD] -- [COMMAND] instead.
Defaulted container "mongo" out of: mongo, cleanup (init)
groups: cannot find name for group ID 303
I have no name!@db-admin-2:/$ cd /tmp
I have no name!@db-admin-2:/tmp$ ls
mongodb-27017.sock

# Get the data dump using mongodump command

I have no name!@db-admin-2:/tmp$ mongodump --port 27017
```

```
2023-02-23T06:58:28.624+0000    writing admin.system.version to dump/admin/system.version.bson
2023-02-23T06:58:28.625+0000    done dumping admin.system.version (2 documents)
2023-02-23T06:58:28.626+0000   writing cust_ref_data.OCS_TABLE to dump/cust_ref_data/OCS_TABLE.bson
2023-02-23T06:58:28.626+0000    writing cust_ref_data.TAC_TABLE_N7 to
dump/cust_ref_data/TAC_TABLE_N7.bson
2023-02-23T06:58:28.626+0000   writing cust_ref_data.DUS_TABLE to dump/cust_ref_data/DUS_TABLE.bson
2023-02-23T06:58:28.627+0000    writing cust_ref_data.TAC_TABLE_N15 to
dump/cust_ref_data/TAC_TABLE_N15.bson
2023-02-23T06:58:28.655+0000    done dumping cust_ref_data.TAC_TABLE_N15 (7152 documents)
2023-02-23T06:58:28.656+0000   writing cust_ref_data.TAC_TABLE to dump/cust_ref_data/TAC_TABLE.bson
2023-02-23T06:58:28.656+0000    done dumping cust_ref_data.TAC_TABLE_N7 (7152 documents)
2023-02-23T06:58:28.657+0000   writing cust_ref_data.USD_TABLE to dump/cust_ref_data/USD_TABLE.bson
2023-02-23T06:58:28.666+0000    done dumping cust_ref_data.OCS_TABLE (7569 documents)
2023-02-23T06:58:28.667+0000    writing cust_ref_data.SGSN_IP_TABLE_2 to
dump/cust_ref_data/SGSN_IP_TABLE_2.bson
2023-02-23T06:58:28.684+0000    done dumping cust_ref_data.TAC_TABLE (7128 documents)
2023-02-23T06:58:28.684+0000    writing cust_ref_data.PLMN_ID_TABLE_N7 to
dump/cust_ref_data/PLMN_ID_TABLE_N7.bson
2023-02-23T06:58:28.687+0000    done dumping cust_ref_data.USD_TABLE (5579 documents)
dump/cust_ref_data/FEATURE_COUNTER_MAPPING.bson
2023-02-23T06:58:28.705+0000    done dumping cust_ref_data.PCC_RULE_TABLE_N7 (747 documents)
2023-02-23T06:58:28.706+0000   writing cust_ref_data.DNN_TABLE to dump/cust_ref_data/DNN_TABLE.bson
2023-02-23T06:58:28.708+0000    done dumping cust_ref_data.DNN_TABLE (194 documents)
2023-02-23T06:58:28.709+0000   writing cust_ref_data.APN_TABLE to dump/cust_ref_data/APN_TABLE.bson
2023-02-23T06:58:28.709+0000    done dumping cust_ref_data.CRN_TABLE (733 documents)
2023-02-23T06:58:28.747+0000    done dumping spr.subscriber_ssid (0 documents)
2023-02-23T06:58:28.747+0000    done dumping spr.subscriber (0 documents)
2023-02-23T06:58:28.747+0000    writing spr.auth_failures to dump/spr/auth_failures.bson
2023-02-23T06:58:28.747+0000    writing spr.location_history to dump/spr/location_history.bson
2023-02-23T06:58:28.749+0000    done dumping scheduler.tasks (0 documents)
2023-02-23T06:58:28.751+0000    done dumping patches.files.chunks (0 documents)
2023-02-23T06:58:28.753+0000    done dumping spr.location_history (0 documents)
2023-02-23T06:58:28.754+0000    done dumping spr.auth_failures (0 documents)
I have no name!@db-admin-2:/tmp$ ls
dump  mongodb-27017.sock

# Create tar file out of dump

I have no name!@db-admin-2:/tmp$ tar cvf db-admin-dump.tar dump
dump/
dump/cust_ref_data/
dump/cust_ref_data/USD_TABLE_N7.metadata.json
dump/cust_ref_data/CRBN_TABLE.metadata.json
dump/cust_ref_data/crdVersionInstance.bson
dump/cust_ref_data/SERVICE_AREA_RESTRICTION_N15.bson
dump/cust_ref_data/N7_CHG_REF_DATA_TABLE.metadata.json
dump/cust_ref_data/TEARDOWN_TABLE_N7.metadata.json
dump/cust_ref_data/QOS_OVERRIDE_TABLE.bson
dump/cust_ref_data/E_PASS_TABLE_IMS.metadata.json
dump/cust_ref_data/CRBN_TABLE_N7.bson
dump/cust_ref_data/TAC_TABLE.bson
dump/cust_ref_data/OCS_TABLE.bson
dump/cust_ref_data/POLICY_CONTROL_REQUEST_TRIGGER_TABLE_N15.metadata.json
dump/cust_ref_data/SL_TABLE.metadata.json
dump/cust_ref_data/N5_psi_mapping_table.metadata.json
dump/cust_ref_data/TRIGGER_TABLE.metadata.json
dump/cust_ref_data/USD_TABLE.bson
dump/cust_ref_data/TEARDOWN_TABLE.metadata.json
dump/cust_ref_data/CRBN_TABLE.bson
dump/cust_ref_data/PLMN_ID_TABLE_N15.bson
dump/cust_ref_data/N5_AUTH_TABLE_N7.bson
dump/cust_ref_data/QOS_OVERRIDE_TABLE_N7.bson
dump/cust_ref_data/RX_AUTH_TABLE_N7.metadata.json
dump/cust_ref_data/IMSI_TABLE.bson
```

```
dump/cust_ref_data/N28_ACTION.metadata.json
dump/cust_ref_data/PLMN_ID_TABLE_N7.metadata.json
dump/cust_ref_data/FEATURE_COUNTER_MAPPING.metadata.json
dump/cust_ref_data/SL_TABLE.bson
dump/cust_ref_data/SUPI_TABLE_N7.bson
dump/cust_ref_data/SGSN_IP_TABLE_2.bson
dump/cust_ref_data/USD_TABLE.metadata.json
dump/cust_ref_data/PLMN_ID_TABLE.bson
dump/cust_ref_data/DUMMY_RAR_TABLE.bson
dump/cust_ref_data/QOS_STATUS_TABLE.metadata.json
dump/policy_trace/trace_id_version.metadata.json
I have no name!@db-admin-2:/tmp$ ls
db-admin-dump.tar  dump  mongodb-27017.sock

Note:- db-admin-dump.tar is the tar file created
```

d) Transfer the dump tar file to the host from the primary db-admin pod.

```
cloud-user@pcf-cm-node-master-1:~$ kubectl cp db-admin-2:/tmp/db-admin-dump.tar db-admin-dump.tar
 -n pcf-ims
Defaulted container "mongo" out of: mongo, cleanup (init)
tar: Removing leading `/' from member names

cloud-user@pcf-cm-node-master-1:~$ ls
about.sh                                                        cpu_Load_Check.sh
ml_clusterHardwareInfo.csv
Automated_System_Info_site1_03_FunctionalPreTest_BVLongevity.txt  db-admin-config-2-dump.tar
nohup.out
Automation_Scripts_repo                                         db-admin-dump.tar
Noisy_Scenario
checkDiskSpace.sh                                               get_deploy_status.sh
PCF_compare_alert_config_with_log.sh
checkMinionCPUAverage.sh                                        GetPCFInstalledBuild.sh
smi_dep_id_rsa
check_mongo_pod_primary.sh                                      GetSystemDeploymentStatus.sh
validateK8sMinionCPUMemory.sh
ConsolidateLogsSummary.py                                       log_start_time.txt
```

Step 3 Collect and backup the Mongo data from the primary members of the db-admin-config pods.

Note Refer to Step 2, for detailed commands for the following steps.

a) Collect the names of the Mongo admin pods.

```
cloud-user@pcf-cm-node-master-1:~$ kubectl get pods -n pcf-ims | grep db-admin-config
db-admin-config-0                                               1/1     Running   0
  13h
db-admin-config-1                                               1/1     Running   0
  13h
db-admin-config-2                                               1/1     Running   0
  13h
```

b) Log in to the db-admin-config pod to acquire access to the primary pod member.
c) Log in to the primary db-admin-config pod and take the dump of data and create the tar file out of the dump.
d) Transfer the dump tar file to the host from the primary db-admin-config pod.

Step 4 SSH to the ops-center, enter "system mode shutdown" at the config prompt, and then commit.

Step 5 Delete the data files from the Mongo admin pods using the PCF namespace on all three master nodes.

```
Master-1
cloud-user@pcf-cm-node-master-1:~$ cd /data
cloud-user@pcf-cm-node-master-1:/data$ ls
cee-cee-pcf  etcd  k8s-offline  kubernetes  pcf-ims  software

# Go to namespace directory

cloud-user@pcf-cm-node-master-1:/data$ cd pcf-ims
cloud-user@pcf-cm-node-master-1:/data/pcf-ims$ ls
db-etcd-pcf-ims-etcd-cluster-0  db-local-data-db-admin-0  db-local-data-db-admin-config-0

# Delete all file under db-local-data-db-admin-0 and db-local-data-db-admin-config-0

cloud-user@pcf-cm-node-master-1:/data/pcf-ims/db-local-data-db-admin-0$sudo rm -rf *
cloud-user@pcf-cm-node-master-1:/data/pcf-ims/db-local-data-db-admin-config-0$sudo rm -rf *

Master-2
cloud-user@pcf-cm-node-master-2:~$ cd /data
cloud-user@pcf-cm-node-master-2:/data$ ls
cee-cee-pcf  etcd  k8s-offline  kubernetes  pcf-ims  software

# Go to namespace directory

cloud-user@pcf-cm-node-master-2:/data$ cd pcf-ims
cloud-user@pcf-cm-node-master-2:/data/pcf-ims$ ls
db-etcd-pcf-ims-etcd-cluster-0  db-local-data-db-admin-0  db-local-data-db-admin-config-0

# Delete all file under db-local-data-db-admin-0 and db-local-data-db-admin-config-0

cloud-user@pcf-cm-node-master-2:/data/pcf-ims/db-local-data-db-admin-0$sudo rm -rf *
cloud-user@pcf-cm-node-master-2:/data/pcf-ims/db-local-data-db-admin-config-0$sudo rm -rf *

Master-3
cloud-user@pcf-cm-node-master-3:~$ cd /data
cloud-user@pcf-cm-node-master-3:/data$ ls
cee-cee-pcf  etcd  k8s-offline  kubernetes  pcf-ims  software

# Go to namespace directory

cloud-user@pcf-cm-node-master-3:/data$ cd pcf-ims
cloud-user@pcf-cm-node-master-3:/data/pcf-ims$ ls
db-etcd-pcf-ims-etcd-cluster-0  db-local-data-db-admin-0  db-local-data-db-admin-config-0

# Delete all file under db-local-data-db-admin-0 and db-local-data-db-admin-config-0

cloud-user@pcf-cm-node-master-3:/data/pcf-ims/db-local-data-db-admin-0$sudo rm -rf *
cloud-user@pcf-cm-node-master-3:/data/pcf-ims/db-local-data-db-admin-config-0$sudo rm -rf *
```

Step 6 Run the April release upgrade (Ubuntu 20.04 and Mongo 4.4).

Post-Upgrade Verification Steps

Procedure

Step 1 Verify that the software is running with the April release after the upgrade.

```
cloud-user@pcf-cm-node-master-1:~$ helm ls -n pcf-ims
NAME                                    NAMESPACE       REVISION        UPDATED
                STATUS          CHART                                                   APP
VERSION
pcf-ims-cnat-cps-infrastructure         pcf-ims         1               2023-02-22 17:58:35.144604765
 +0000 UTC deployed        cnat-cps-infrastructure-0.6.10-main-0045-230214110634-13d42ee
BUILD_2023.02.m0.i18
pcf-ims-cps-diameter-ep-rx-protocol-1   pcf-ims         1               2023-02-22 17:58:35.145251077
 +0000 UTC deployed        cps-diameter-ep-0.6.43-main-0399-230207041116-a31a488
BUILD_2023.02.m0.i18
pcf-ims-cps-ldap-ep                     pcf-ims         1               2023-02-22 17:58:35.034167458
 +0000 UTC deployed        cps-ldap-ep-0.8.13-main-0612-230208043335-ad5f65d
BUILD_2023.02.m0.i18
pcf-ims-etcd-cluster                    pcf-ims         1               2023-02-22 17:58:35.139498443
 +0000 UTC deployed        etcd-cluster-1.4.0-1-4-0130-221017070357-25906ad
BUILD_2023.02.m0.i18
pcf-ims-network-query                   pcf-ims         1               2023-02-22 17:58:35.121107291
 +0000 UTC deployed        network-query-0.5.4-main-0057-230206125913-ed3642a
BUILD_2023.02.m0.i18
pcf-ims-ngn-datastore                   pcf-ims         1               2023-02-22 17:58:35.139994348
 +0000 UTC deployed        ngn-datastore-1.10.0-1-10-0997-230210092614-c6b6164
BUILD_2023.02.m0.i18
pcf-ims-ops-center                      pcf-ims         15              2023-02-22 10:55:58.982801266
 +0000 UTC deployed        pcf-ops-center-0.6.32-main-0445-230221061642-374d10a
BUILD_2023.02.m0.i18
pcf-ims-pcf-config                      pcf-ims         1               2023-02-22 17:58:35.151228581
 +0000 UTC deployed        pcf-config-0.6.3-main-0021-221221114706-77d0a10
BUILD_2023.02.m0.i18
pcf-ims-pcf-dashboard                   pcf-ims         1               2023-02-22 17:58:35.152400298
 +0000 UTC deployed        pcf-dashboard-0.2.17-main-0136-221005221847-13bfa13
BUILD_2023.02.m0.i18
pcf-ims-pcf-engine-app-production       pcf-ims         1               2023-02-22 17:58:35.125468923
 +0000 UTC deployed        pcf-engine-app-0.8.16-main-0424-230208043521-b26d906
BUILD_2023.02.m0.i18
pcf-ims-pcf-ldapserver-ep               pcf-ims         1               2023-02-22 17:58:35.152091423
 +0000 UTC deployed        pcf-ldapserver-ep-0.1.8-main-0080-221220155902-e80a62f
BUILD_2023.02.m0.i18
pcf-ims-pcf-oam-app                     pcf-ims         1               2023-02-22 17:58:35.154061042
 +0000 UTC deployed        pcf-oam-app-0.6.2-main-0015-230206125249-2118fad
BUILD_2023.02.m0.i18
pcf-ims-pcf-rest-ep                     pcf-ims         1               2023-02-22 17:58:35.136755614
 +0000 UTC deployed        pcf-rest-ep-0.7.46-main-0960-230118121105-2fd07f9
BUILD_2023.02.m0.i18
pcf-ims-pcf-services                    pcf-ims         1               2023-02-22 17:58:35.146493569
 +0000 UTC deployed        pcf-services-0.6.17-main-0074-221221114612-90ebedc
BUILD_2023.02.m0.i18
```

Step 2 SSH to the ops-center, enter "system mode running" in the configuration prompt, and then commit.

Step 3 Use the same commands as in Step 1, and verify that all the pods and nodes are operational.

Step 4 Restore the Mongo dump to the db-admin pod as the primary member.

```
# copy the dump tar file to primary member of db-admin

cloud-user@pcf-cm-node-master-1:~$ kubectl cp db-admin-dump.tar db-admin-2:/tmp -n pcf-ims
Defaulted container "mongo" out of: mongo, cleanup (init)

# login to primary member of db-admin go to the path of the dump tar and restore dump using
"mongorestore --port=27017 <dump tar file name>"

cloud-user@pcf-cm-node-master-1:~$ kubectl exec -it db-admin-2 -n pcf-ims bash
kubectl exec [POD] [COMMAND] is DEPRECATED and will be removed in a future version. Use kubectl exec
 [POD] -- [COMMAND] instead.
Defaulted container "mongo" out of: mongo, cleanup (init)
```

```
groups: cannot find name for group ID 303
I have no name!@db-admin-2:/$ cd /tmp
I have no name!@db-admin-2:/tmp$ ls
db-admin-dump.tar  dump  mongodb-27017.sock

# Untar the dump tar file

I have no name!@db-admin-2:/tmp$ tar xvf db-admin-dump.tar
dump/
dump/cust_ref_data/
dump/cust_ref_data/USD_TABLE_N7.metadata.json
dump/cust_ref_data/CRBN_TABLE.metadata.json
dump/cust_ref_data/crdVersionInstance.bson
dump/cust_ref_data/SERVICE_AREA_RESTRICTION_N15.bson
dump/cust_ref_data/N7_CHG_REF_DATA_TABLE.metadata.json
dump/spr/subscriber_ssid.bson
dump/spr/subscriber.bson
dump/spr/subscriber.metadata.json
dump/admin/
dump/admin/system.version.bson
dump/admin/system.version.metadata.json
dump/scheduler/
dump/scheduler/tasks.bson
dump/scheduler/tasks.metadata.json
dump/policy_trace/
dump/policy_trace/traces.bson
dump/policy_trace/traces.metadata.json
dump/policy_trace/trace_id_version.bson
dump/policy_trace/trace_id_version.metadata.json

# Run restore command to restore data
I have no name!@db-admin-2:/tmp$ mongorestore --port=27017 dump
2023-02-23T10:19:28.068+0000    preparing collections to restore from
2023-02-23T10:19:28.070+0000    reading metadata for cust_ref_data.n7-pcc-rule from
dump/cust_ref_data/n7-pcc-rule.metadata.json
2023-02-23T10:19:28.070+0000    reading metadata for cust_ref_data.n7-policy-trigger from
dump/cust_ref_data/n7-policy-trigger.metadata.json
2023-02-23T10:19:28.070+0000    reading metadata for cust_ref_data.volte from
dump/cust_ref_data/volte.metadata.json
2023-02-23T10:19:28.070+0000    reading metadata for keystore.keystore from
dump/keystore/keystore.metadata.json
2023-02-23T10:19:28.070+0000    reading metadata for cust_ref_data.Called_station_id from
dump/cust_ref_data/Called_station_id.metadata.json
2023-02-23T10:19:28.070+0000    reading metadata for cust_ref_data.N7_QoS_Mapping_Ldap from
dump/cust_ref_data/N7_QoS_Mapping_Ldap.metadata.json
2023-02-23T10:19:28.070+0000    reading metadata for cust_ref_data.PSI_Mapping from
2023-02-23T10:19:28.071+0000    reading metadata for cust_ref_data.n5-charging-rules from
dump/cust_ref_data/n5-charging-rules.metadata.json
2023-02-23T10:19:28.071+0000    reading metadata for keystore.changes from
dump/keystore/changes.metadata.json
2023-02-23T10:19:28.071+0000    reading metadata for config.cache.collections from
dump/config/cache.collections.metadata.json
2023-02-23T10:19:28.071+0000    reading metadata for cust_ref_data.QosDesc from
dump/cust_ref_data/QosDesc.metadata.json

2023-02-23T10:19:34.742+0000    index: &idx.IndexDocument{Options:primitive.M{"name":"state_1",
"ns":"scheduler.tasks", "v":2}, Key:primitive.D{primitive.E{Key:"state", Value:1}},
PartialFilterExpression:primitive.D(nil)}
2023-02-23T10:19:34.742+0000    index: &idx.IndexDocument{Options:primitive.M{"name":"runningOn_1",
 "ns":"scheduler.tasks", "v":2}, Key:primitive.D{primitive.E{Key:"runningOn", Value:1}},
PartialFilterExpression:primitive.D(nil)}
2023-02-23T10:19:34.742+0000    index: &idx.IndexDocument{Options:primitive.M{"name":"type_1",
"ns":"scheduler.tasks", "v":2}, Key:primitive.D{primitive.E{Key:"type", Value:1}},
PartialFilterExpression:primitive.D(nil)}
```

```
2023-02-23T10:19:34.742+0000    index: &idx.IndexDocument{Options:primitive.M{"name":"scheduleTime_1",
 "ns":"scheduler.tasks", "v":2}, Key:primitive.D{primitive.E{Key:"scheduleTime", Value:1}},
PartialFilterExpression:primitive.D(nil)}
2023-02-23T10:19:34.743+0000    62 document(s) restored successfully. 15 document(s) failed to restore.

Note: Some duplicate key errors like below are expected. Please ignore the same.
2023-02-21T09:51:55.708+0000 continuing through error: E11000 duplicate key error collection:
config.mongos index: _id_ dup key: { _id: "admin-db-0:27017" }
```

Step 5 Use the same commands as in Step 4, Restore the Mongo dump to the db-admin-config pod as the primary member.

Step 6 Check the PB and CRD data is loading.

Step 7 Use the same commands as in Step 1, and verify that all the pods and nodes are operational.

Admin DB replica set for cross-cluster sharing

Table 3: Feature History Table

Feature	Release	Description
Shared admin DB support for PCF clusters	2025.03.0	This feature supports the validation of the PCF with Admin Database (DB) replica sets that are created in the PCF namespace and configured for sharing across clusters. This allows the Admin DB to be effectively shared and accessed from different clusters, ensuring that functionalities like CRD import/export work correctly in this distributed setup.

This feature supports the validation of the PCF with Admin DB replica sets similar to SPR that are created in the PCF namespace and configured for sharing across clusters. The primary goal is to enable PCF components such as CRD, subscriber tracing, Engine, and Policy Builder pods to handle connections to the Admin DB using specific IP addresses and ports (configured as a replica set) instead of relying on default hostnames.

The key functionalities of this feature includes:

- Ops-center configuration to update the connection details for components such as CRD API used by the engine.
- Configuration update in Policy Builder page.

Ops-center configuration to manage admin DB replica set

Configure admin DB replica set

Prerequisite: Ensure to configure the node label through cluster sync in cluster VM. Here, the node label is configured as `db-admin`.

The PCF ops-center configures and manages the admin DB replica set. This includes defining the replica set members, their hosts IP addresses, ports, and other details.

Here is the sample configuration for admin DB replica set:

```
db scdb replica-name admin-db
  port      69001
  interface ens192
  resource memory limit 2000
  replica-set-label key smi.cisco.com/node-type-5
  replica-set-label value db-admin
  member-configuration member sdb-rs1-s1-m1
   host     10.0.0.00
    arbiter  false
    priority 102
    site     local
  exit
  member-configuration member sdb-rs1-s1-m2
    host     10.0.0.001
    arbiter  false
    priority 101
    site     local
 exit
member-configuration member sdb-rs1-s1-m2
    host     10.1.2.113
    arbiter  false
    priority 101
    site     local
 exit
member-configuration member sdb-rs1-s2-m1
    host     10.1.4.21
    arbiter  false
    priority 102
    site     remote
 exit
 member-configuration member sdb-rs1-s2-m2
    host     10.1.4.34
    arbiter  false
    priority 101
    site     remote
 exit
 exit
```

Update CRD API properties

The following command allows to update the connection details for components like the CRD API used by the engine:

engine pcf-green crdapi admin-db primary *Primary-member-IP* **secondary** *Secondary-member-IP* **port** *DB-PORT>*

Here is the sample configuration:

```
engine pcf-green crdapi admin-db primary 10.0.0.00 secondary 10.0.0.001 port
 69001
```

Configure Policy Builder with host IP address

This configuration helps to use the host IP addresses for accessing the Admin DB in CRD section of Policy Builder page.

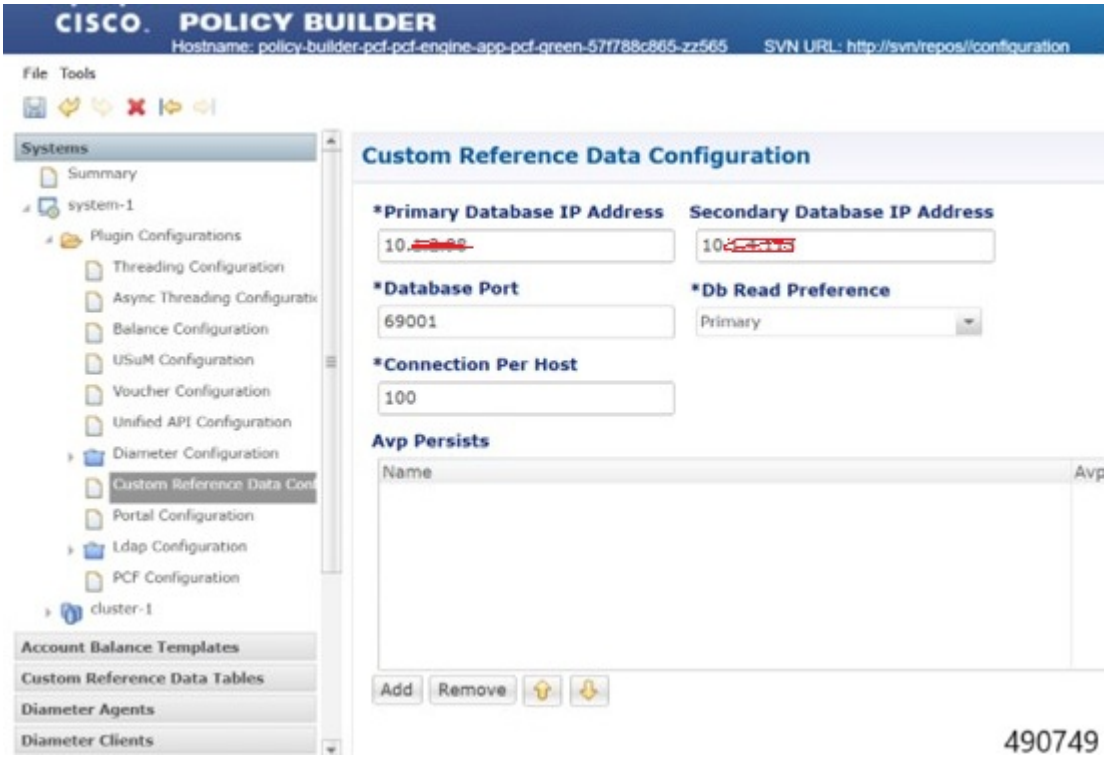
Procedure

Step 1 Login to the Policy Builder page and select the **Plugin Configurations** in the left pane of the PB page.

Step 2 Select the **Custom Reference Data Configuration** option.

Step 3 Update the mandatory values to configure the host IP address to access the admin DB.

Figure 1: PB configuration



Step 4 Select the cluster option **cluster-1** from the left pane of PB page and add the mandatory values.

Figure 2: Trace database

