설치 및 환경설정

CM Observer를 사용한 TSC(Single-Single) 구축 시나리오

TMAXTibero

TINTI032

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안내서 정보
안내서 제목: TSC(Single-Single) 구축 시나리오
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제, 개정 이력

안내서 버전	개정일자	개정 사유 및 내용	비고
1.0.0	2025.12.23	최초 제정	

목차

0. TSC 환경 설정

본 문서는 Observer(구 coordinator)를 사용한 Single-Single Instance의 TSC 구축을 설명합니다. 본 문서에는 Tibero 설치를 위한 OS 설치, 패키지 설치 및 커널 파라미터 설정 등에 대해서는 기술하고 있지 않습니다. 해당 작업들은 모두 사전에 진행하였다는 가정 하에 작성되었습니다.

(1) 테스트 버전

- OS: Rocky Linux release 9.6 (Blue Onyx) / 5.14.0-570.17.1.el9_6.x86_64
- Tibero: Tibero 7 (DB 7.2.4) Build 303837

(2) 테스트 환경

- Server

항목	Node 1 (Primary)	Node 2 (Standby)
Hostname	server1	server2
OS user	tibero	tibero / observer
Inter-Connect IP	192.168.182.128 (ens192)	192.168.182.129 (ens192)
Public IP	192.168.92.128 (ens160)	192.168.92.129 (ens160)

- DB (tibero 유저)

항목	Node 1 (Primary)	Node 2 (Standby)
DB Name	tibero	
SID	tibero_p	tibero_s
LISTENER_PORT	8629	8629
CM_PORT	11039	11039

- CM (tibero 유저)

항목	Node 1 (Primary)	Node 2 (Standby)
CM Name (SID)	cm_p	cm_s
CM Inter-Connect IP	192.168.182.128 (ens192)	192.168.182.129 (ens192)
CM Inter-Connect Port	11019	11019
CM_UI_PORT	11039	11039

- Observer (observer 유저)

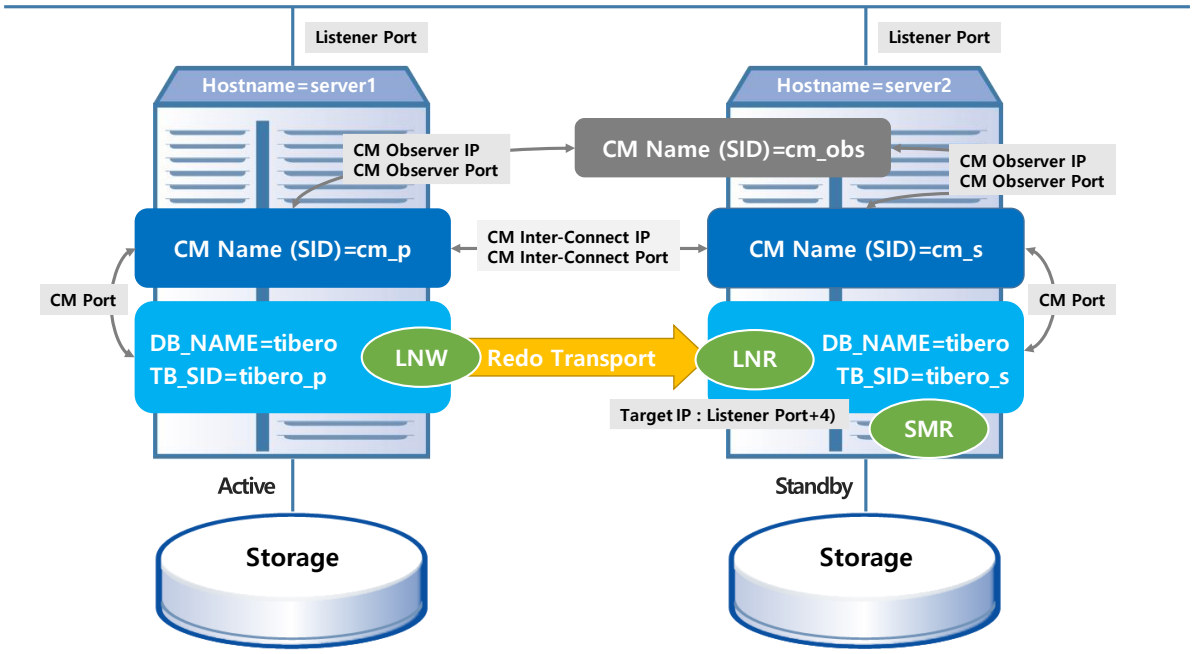
항목	-	Node 2 (Standby)
CM Name (SID)	-	cm_obs
CM_OBSERVER_PORT	-	9629
CM_UI_PORT	-	21039

(3) 구성도

위 환경처럼 2대의 서버를 이용한 구성도입니다.

Primary 서버에 tibero 유저. Standby 서버에 tibero, observer 유저를 구성하였습니다.

* Inter-Connect IP를 사용한 설정값들은 모두 Public IP로 대체 가능합니다.



1. Observer 구성

(1) 환경 설정

Standby Server에 생성한 observer 유저로 아래와 같이 설정합니다.

① .bash_profile

```
# .bash_profile

# Get the aliases and functions
if [ -f ~/.bashrc ]; then
                . ~/.bashrc
fi

# User specific environment and startup programs
PATH=$PATH:$HOME/.local/bin:$HOME/bin
export PATH

#--------------------------------------------------
# profile ENV
#--------------------------------------------------
umask 027
set -o vi
stty erase ^H
export EDITOR=vi
export TERM=vt100
export PS1="[\$LOGNAME@`hostname`:\$TB_SID:\$PWD]"

#--------------------------------------------------
# TIBERO ENV
#--------------------------------------------------
export TB_HOME=/home/observer/tibero7
export TB_PROF_DIR=$TB_HOME/bin/prof
export PATH=.:$TB_HOME/bin:$TB_HOME/client/bin:$PATH
export LD_LIBRARY_PATH=$TB_HOME/lib:$TB_HOME/client/lib:$LD_LIBRARY_PATH

#--------------------------------------------------
# CM ENV
#--------------------------------------------------
export CM_SID=cm_obs
export CM_HOME=$TB_HOME
```

② 설치 파일 압축 해제

```
[observer@server2::/media]tar -xvzf tibero7-bin-FS02_PS04-linux64_4.18-303837-20251015084658.tar.gz -C /home/observer
```

③ $CM_SID.tip 파일 ($TB_HOME/config 경로에 생성)

```
CM_NAME=cm_obs
CM_MODE_OBSERVER=Y
CM_OBSERVER_PORT=9629
CM_UI_PORT=21039
```

(2) Observer 기동

위와 같이 설정되었다면, Observer를 기동합니다.

```
[observer@server2::/home/observer/tibero7/config]tbcmobs -b

TBCM OBSERVER MODE 7.1.1 (Build 303837)

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Tibero cluster manager observer started up.
Local observer name is (cm_obs:21039).
```

기동 확인

```
[observer@server2::/home/observer/tibero7/config]cmrctl show
Resource List of Observer cm_obs
================================================================
  TSC_ID     CLS_ID       CM_NAME       NID     CM_STAT     INST_STAT     PRI/TAR
-------- -------- ----------- ----- --------- ----------- ---------
                                      NO RESOURCE
================================================================
```

2. Primary Server 구성

(1) 환경 설정

Primary Server에 생성한 tibero 유저로 아래와 같이 설정합니다.

① .bash_profile

```
# .bash_profile

# Get the aliases and functions
if [ -f ~/.bashrc ]; then
                . ~/.bashrc
fi

# User specific environment and startup programs
PATH=$PATH:$HOME/.local/bin:$HOME/bin
export PATH

#---------------------------------------------------
# profile ENV
#---------------------------------------------------
umask 027
set -o vi
stty erase ^H
export EDITOR=vi
export TERM=vt100
export PS1="[\$LOGNAME@`hostname`:\$TB_SID:\$PWD]"

#---------------------------------------------------
# TIBERO ENV
#---------------------------------------------------
export TB_SID=tibero_p
export TB_HOME=/home/tibero/tibero7
export TB_PROF_DIR=$TB_HOME/bin/prof
export PATH=.:$TB_HOME/bin:$TB_HOME/client/bin:$PATH
export LD_LIBRARY_PATH=$TB_HOME/lib:$TB_HOME/client/lib:$LD_LIBRARY_PATH

#---------------------------------------------------
# CM ENV
#---------------------------------------------------
export CM_SID=cm_p
export CM_HOME=$TB_HOME
```

② 설치 파일 압축 해제 / 라이선스 적용 / gen_tip.sh 수행

```
#. 설치 파일 압축 해제
[tibero@server1:tibero_p:/media]tar -xvzf tibero7-bin-FS02_PS04-linux64_4.18-303837-20251015084658.tar.gz -C /home/tibero/

#. 라이선스 적용 (Enterprise Edition)
[tibero@server1:tibero_p:/media]cp license.xml $TB_HOME/license/

#. gen_tip.sh 수행
[tibero@server1:tibero_p:/home/tibero/tibero7/config]sh gen_tip.sh
Using TB_SID "tibero_p"
/home/tibero/tibero7/config/tibero_p.tip generated
/home/tibero/tibero7/config/psm_commands generated
/home/tibero/tibero7/client/config/tbdsn.tbr generated.
```

```
Running client/config/gen_esql_cfg.sh
Done.
```

③ $TB_SID.tip 파일 ($TB_HOME/config 경로)

```
########################################
### Database Identification
########################################
DB_NAME=tibero
LISTENER_PORT=8629

########################################
### File Configuration
########################################
CONTROL_FILES="/home/tibero/tbdata/control01.ctl"
DB_CREATE_FILE_DEST="/home/tibero/tbdata"

########################################
### Memory & Session
########################################
MEMORY_TARGET=3G
TOTAL_SHM_SIZE=2G
MAX_SESSION_COUNT=50

########################################
## Archive Log Mode
########################################
LOG_ARCHIVE_FORMAT="log-t%t-r%r-s%s.arc"
LOG_ARCHIVE_DEST="/home/tibero/tbarch"

########################################
### Cluster Manager
########################################
CM_PORT=11039 # $CM_SID.tip 파일의 CM_UI_PORT
STANDBY_USE_OBSERVER=Y

########################################
##### TSC
########################################
LOG_REPLICATION_MODE=PERFORMANCE
LOG_REPLICATION_DEST_1="192.168.182.129:8633 LGWR ASYNC" # Target IP: Listener Port+4
```

④ $CM_SID.tip 파일 ($TB_HOME/config 경로에 생성)

```
CM_NAME=cm_p
CM_UI_PORT=11039 # $TB_SID.tip 파일의 CM_PORT
CM_RESOURCE_FILE=/home/tibero/cm_p/cm_res
```

⑤ tbdsn.tbr 파일 ($TB_HOME/client/config 경로)

```
tibero_p=(
    (INSTANCE=(HOST=localhost)
              (PORT=8629)
              (DB_NAME=tibero)
    )
)
```

(2) CM 기동 및 리소스 등록

위와 같이 설정되었다면, CM을 기동하고 확인합니다.

```
[tibero@server1:tibero_p:/home/tibero/tibero7]tbcm -b
CM Guard daemon started up.

TBCM 7.1.1 (Build 303837)

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Tibero cluster manager started up.
Local node name is (cm_p:11039).

[tibero@server1:tibero_p:/home/tibero/tibero7]cmrctl show
Resource List of Node cm_p
================================================================
   CLUSTER        TYPE            NAME           STATUS                DETAIL
---------- -------- -------------- -------- ------------------------
                                    NO RESOURCE
================================================================
```

CM 리소스를 차례로 등록합니다.

```
#. PRIVATE 네트워크 등록
[tibero@server1:tibero_p:/home/tibero/tibero7]cmrctl add network --name tibero_inter1 --nettype private --ipaddr
192.168.182.128 --portno 11019
Resource add success! (network, tibero_inter1)

#. PUBLIC 네트워크 등록
[tibero@server1:tibero_p:/home/tibero/tibero7]cmrctl add network --name tibero_pub1 --nettype public --ifname ens160
Resource add success! (network, tibero_pub1)

#. CLUSTER 등록
[tibero@server1:tibero_p:/home/tibero/tibero7]cmrctl add cluster --name tibero_cls1 --incnet tibero_inter1 --pubnet tibero_pub1 -
-cfile "/home/tibero/cm_p/cfile1"
Resource add success! (cluster, tibero_cls1)

#. CLUSTER 시작
[tibero@server1:tibero_p:/home/tibero/tibero7]cmrctl start cluster --name tibero_cls1
No root permission! vip is not available. => 해당 문구 무시

#. SERVICE 등록
[tibero@server1:tibero_p:/home/tibero/tibero7]cmrctl add service --name tibero --cname tibero_cls1 --tscid 11 --obsip
192.168.92.129 --obsport 9629
Resource add success! (service, tibero)

#. DB 등록
[tibero@server1:tibero_p:/home/tibero/tibero7]cmrctl add db --name tibero_p --svcname tibero --dbhome /home/tibero/tibero7 --
envfile /home/tibero/.bash_profile
Resource add success! (db, tibero_p)
```

등록된 리소스를 확인합니다.

```
[tibero@server1:tibero_p:/home/tibero/tibero7]cmrctl show
Resource List of Node cm_p
```

```
=====================================================================
  CLUSTER        TYPE            NAME           STATUS                  DETAIL
----------- -------- -------------- -------- ------------------------
       COMMON    network    tibero_inter1           UP (private) 192.168.182.128/11019
       COMMON    network       tibero_pub1           UP (public) ens160
       COMMON    cluster       tibero_cls1           UP inc: tibero_inter1, pub: tibero_pub1
tibero_cls1         file    tibero_cls1:0           UP /home/tibero/cm_p/cfile1
tibero_cls1    service               tibero        DOWN Database, Active Cluster (auto-restart: OFF)
tibero_cls1            db           tibero_p        DOWN tibero, /home/tibero/tibero7, failed retry cnt: 0
=====================================================================
```

(3) Database 생성

Nomount 모드 기동

```
[tibero@server1:tibero_p:/home/tibero/tibero7]tbboot nomount
Change core dump dir to /home/tibero/tibero7/bin/prof.
Listener port = 8629

Tibero 7

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Tibero instance started up (NOMOUNT mode).
```

Database 생성 (ARCHIVELOG 모드)

```
SQL> create database
  user sys identified by tibero
  ARCHIVELOG
  MAXLOGFILES 255
  MAXLOGMEMBERS 8
  MAXDATAFILES 1024
  MAXARCHIVELOG 500
  MAXBACKUPSET 500
  MAXLOGHISTORY 500
  CHARACTER SET UTF8
  NATIONAL CHARACTER SET UTF16
  logfile
      group 1 ('/home/tibero/tbdata/redo01_a.log','/home/tibero/tbdata/redo01_b.log') size 200M,
      group 2 ('/home/tibero/tbdata/redo02_a.log','/home/tibero/tbdata/redo02_b.log') size 200M,
      group 3 ('/home/tibero/tbdata/redo03_a.log','/home/tibero/tbdata/redo03_b.log') size 200M
  datafile '/home/tibero/tbdata/system001.dtf' size 100M
    autoextend on next 16M maxsize unlimited
  SYSSUB
    datafile '/home/tibero/tbdata/syssub001.dtf' size 10M
    autoextend on next 16M maxsize unlimited
  default temporary tablespace TEMP
    tempfile '/home/tibero/tbdata/temp001.dtf' size 100M
    autoextend on next 16M maxsize unlimited
    extent management local autoallocate
  undo tablespace UNDO
    datafile '/home/tibero/tbdata/undo001.dtf' size 200M
    autoextend on next 16M maxsize unlimited
    extent management local autoallocate
  default tablespace USR
    datafile   '/home/tibero/tbdata/usr001.dtf' size 100M
    autoextend on next 16M maxsize unlimited
    extent management local autoallocate
;
```

```
Database created.
```

NORMAL 기동

```
[tibero@server1:tibero_p:/home/tibero]tbboot
Change core dump dir to /home/tibero/tibero7/bin/prof.
Listener port = 8629

Tibero 7

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Tibero instance started up (NORMAL mode).
```

system_install.sh로 시스템 오브젝트 생성

```
[tibero@server1:tibero_p:/home/tibero/tibero7/scripts]sh system_install.sh -p1 tibero -p2 syscat
Creating internal system tables...
Creating additional system index...
Creating client policy table ...
Setting case insensitive password...
Create system tables related to dbms_redact...
Creating text packages table ...
Inserting for text packages table ...
Creating the role DBA...
Creating system users & roles...
Creating example users...
Creating virtual tables...
Granting public access to _VT_DUAL...

(생략)

Setting system_install.sh parameter...
Done.
For details, check /home/tibero/tibero7/instance/tibero_p/log/system_init.log
```

3. Primary Server Cold backup본 Standby 복사

(1) Primary Server DB 다운

DB 종료 및 CM 종료

```
[tibero@server1:tibero_p:/home/tibero/tibero7]cmrctl show
Resource List of Node cm_p
================================================================
   CLUSTER        TYPE            NAME           STATUS                DETAIL
---------- -------- ------------ -------- ----------------------
        COMMON    network    tibero_inter1          UP (private) 192.168.182.128/11019
        COMMON    network      tibero_pub1           UP (public) ens160
        COMMON    cluster      tibero_cls1          UP inc: tibero_inter1, pub: tibero_pub1
tibero_cls1         file    tibero_cls1:0          UP /home/tibero/cm_p/cfile1
tibero_cls1    service              tibero          UP Database, Active Cluster (auto-restart: OFF)
tibero_cls1           db           tibero_p UP(NRML) tibero, /home/tibero/tibero7, failed retry cnt: 0
================================================================
[tibero@server1:tibero_p:/home/tibero/tibero7]tbdown immediate

Tibero instance terminated (IMMEDIATE mode).

[tibero@server1:tibero_p:/home/tibero/tibero7]tbcm -d
CM DOWN SUCCESS!
```

(2) Cold backup 파일 복사

Primary의 모든 데이터파일을 Standby 서버의 데이터파일 경로로 복사 (password 파일 포함)

```
[tibero@server1:tibero_p:/home/tibero/tbdata]scp -rp /home/tibero/tbdata/ root@192.168.92.129:/home/tibero/
The authenticity of host '192.168.92.129 (192.168.92.129)' can't be established.
ED25519 key fingerprint is SHA256:83PSgrZJl73KrhEPu7FrZlIMENauH+SqA9WKXfY/07s.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.92.129' (ED25519) to the list of known hosts.
root@192.168.92.129's password:
control01.ctl                                 100%   74MB 156.0MB/s   00:00
redo01_a.log                                  100%  200MB 187.5MB/s   00:01
redo01_b.log                                  100%  200MB 189.3MB/s   00:01
redo02_a.log                                  100%  200MB 149.0MB/s   00:01
redo02_b.log                                  100%  200MB 198.8MB/s   00:01
redo03_a.log                                  100%  200MB 179.5MB/s   00:01
redo03_b.log                                  100%  200MB 175.9MB/s   00:01
system001.dtf                                 100%  100MB 187.1MB/s   00:00
undo001.dtf                                   100%  200MB 166.1MB/s   00:01
temp001.dtf                                   100%  100MB 195.3MB/s   00:00
usr001.dtf                                    100%  100MB 212.9MB/s   00:00
syssub001.dtf                                 100%   58MB 194.7MB/s   00:00
.passwd                                       100%   88   101.9KB/s   00:00
```

Standby에서 복사된 파일 확인 및 tibero 권한 부여

```
[root@server2 ~]# chown -R tibero:dba /home/tibero/tbdata/
[root@server2 ~]# su - tibero
[tibero@server2:tibero2:/home/tibero]ls -alrt tbdata
```

4. Standby Server 구성

(1) 환경 설정

Standby Server에 생성한 tibero 유저로 아래와 같이 설정합니다.

① .bash_profile

```
# .bash_profile

# Get the aliases and functions
if [ -f ~/.bashrc ]; then
        . ~/.bashrc
fi

# User specific environment and startup programs
PATH=$PATH:$HOME/.local/bin:$HOME/bin
export PATH

#---------------------------------------------------
# profile ENV
#---------------------------------------------------
umask 027
set -o vi
stty erase ^H
export EDITOR=vi
export TERM=vt100
export PS1="[\$LOGNAME@`hostname`:\$TB_SID:\$PWD]"

#---------------------------------------------------
# TIBERO ENV
#---------------------------------------------------
export TB_SID=tibero_s
export TB_HOME=/home/tibero/tibero7
export TB_PROF_DIR=$TB_HOME/bin/prof
export PATH=.:$TB_HOME/bin:$TB_HOME/client/bin:$PATH
export LD_LIBRARY_PATH=$TB_HOME/lib:$TB_HOME/client/lib:$LD_LIBRARY_PATH

#---------------------------------------------------
# CM ENV
#---------------------------------------------------
export CM_SID=cm_s
export CM_HOME=$TB_HOME
```

② 설치 파일 압축 해제 / 라이선스 적용 / gen_tip.sh 수행

```
#. 설치 파일 압축 해제
[tibero@server2:tibero_s:/media]tar -xvzf tibero7-bin-FS02_PS04-linux64_4.18-303837-20251015084658.tar.gz -C /home/tibero/

#. 라이선스 적용 (Enterprise Edition)
[tibero@server2:tibero_s:/media]cp license.xml $TB_HOME/license/

#. gen_tip.sh 수행
[tibero@server2:tibero_s:/home/tibero/tibero7/config]sh gen_tip.sh
Using TB_SID "tibero_s"
/home/tibero/tibero7/config/tibero_s.tip generated
/home/tibero/tibero7/config/psm_commands generated
/home/tibero/tibero7/client/config/tbdsn.tbr generated.
```

```
Running client/config/gen_esql_cfg.sh
Done.
```

③ $TB_SID.tip 파일 ($TB_HOME/config 경로)

```
########################################
### Database Identification
########################################
DB_NAME=tibero
LISTENER_PORT=8629

########################################
### File Configuration
########################################
CONTROL_FILES="/home/tibero/tbdata/control01.ctl"
DB_CREATE_FILE_DEST="/home/tibero/tbdata"

########################################
### Memory & Session
########################################
MEMORY_TARGET=3G
TOTAL_SHM_SIZE=2G
MAX_SESSION_COUNT=50

########################################
## Archive Log Mode
########################################
LOG_ARCHIVE_FORMAT="log-t%t-r%r-s%s.arc"
LOG_ARCHIVE_DEST="/home/tibero/tbarch"

########################################
### Cluster Manager
########################################
CM_PORT=11039 # $CM_SID.tip 파일의 CM_UI_PORT
STANDBY_USE_OBSERVER=Y

########################################
##### TSC
########################################
LOG_REPLICATION_MODE=PERFORMANCE
LOG_REPLICATION_DEST_1="192.168.182.128:8633 LGWR ASYNC" # Standby IP: Listener Port+4
```

④ $CM_SID.tip 파일 ($TB_HOME/config 경로에 생성)

```
CM_NAME=cm_s
CM_UI_PORT=11039 # $TB_SID.tip 파일의 CM_PORT
CM_RESOURCE_FILE=/home/tibero/cm_s/cm_res
```

⑤ tbdsn.tbr 파일 ($TB_HOME/client/config 경로)

```
tibero_s=(
    (INSTANCE=(HOST=localhost)
              (PORT=8629)
              (DB_NAME=tibero)
    )
)
```

(2) CM 기동 및 리소스 등록

위와 같이 설정되었다면, CM 기동 및 확인

```
[tibero@server2:tibero_s:/home/tibero/tibero7]tbcm -b
CM Guard daemon started up.

TBCM 7.1.1 (Build 303837)

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Tibero cluster manager started up.
Local node name is (cm_p:11039).

[tibero@server2:tibero_s:/home/tibero/tibero7]cmrctl show
Resource List of Node cm_s
================================================================
   CLUSTER        TYPE            NAME           STATUS                DETAIL
---------- -------- -------------- -------- ------------------------
                                    NO RESOURCE
================================================================
```

CM 리소스 등록

```
#. PRIVATE 네트워크 등록
[tibero@server2:tibero_s:/home/tibero/tibero7]cmrctl add network --name tibero_inter1 --nettype private --ipaddr
192.168.182.129 --portno 11019
Resource add success! (network, tibero_inter1)

#. PUBLIC 네트워크 등록
[tibero@server2:tibero_s:/home/tibero/tibero7]cmrctl add network --name tibero_pub1 --nettype public --ifname ens160
Resource add success! (network, tibero_pub1)

#. CLUSTER 등록
[tibero@server2:tibero_s:/home/tibero/tibero7]cmrctl add cluster --name tibero_cls1 --incnet tibero_inter1 --pubnet tibero_pub1 -
-cfile "/home/tibero/cm_s/cfile1"
Resource add success! (cluster, tibero_cls1)

#. CLUSTER 시작
[tibero@server2:tibero_s:/home/tibero/tibero7]cmrctl start cluster --name tibero_cls1
No root permission! vip is not available. => 해당 문구 무시

#. SERVICE 등록
[tibero@server2:tibero_s:/home/tibero/tibero7]cmrctl add service --name tibero --cname tibero_cls1 --tscid 11 --obsip
192.168.92.129 --obsport 9629
Resource add success! (service, tibero)

#. DB 등록
[tibero@server2:tibero_s:/home/tibero/tibero7]cmrctl add db --name tibero_s --svcname tibero --dbhome /home/tibero/tibero7 --
envfile /home/tibero/.bash_profile
Resource add success! (db, tibero_s)
```

리소스 확인

```
[tibero@server2:tibero_s:/home/tibero/tibero7]cmrctl show
Resource List of Node cm_s
```

```
================================================================
   CLUSTER         TYPE            NAME           STATUS                 DETAIL
---------- -------- -------------- -------- ------------------------
        COMMON    network    tibero_inter1            UP (private) 192.168.182.129/11019
        COMMON    network       tibero_pub1             UP (public) ens160
        COMMON    cluster       tibero_cls1            UP inc: tibero_inter1, pub: tibero_pub1
tibero_cls1         file    tibero_cls1:0            UP /home/tibero/cm_s/cfile1
tibero_cls1    service              tibero         DOWN Database, Active Cluster (auto-restart: OFF)
tibero_cls1           db            tibero_s         DOWN tibero, /home/tibero/tibero7, failed retry cnt: 0
================================================================
```

(3) Standby 기동

Mount 모드 기동

```
[tibero@server2:tibero_s:/home/tibero/tibero7]tbboot mount
Change core dump dir to /home/tibero/tibero7/bin/prof.
Listener port = 8629

Tibero 7

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Tibero instance started up (MOUNT mode).
```

Standby Controlfile 변경

```
SQL> alter database standby controlfile;

Database altered.
```

RECOVERY 모드 기동

```
[tibero@server2:tibero_s:/home/tibero/tibero7]tbdown immediate

Tibero instance terminated (IMMEDIATE mode).

[tibero@server2:tibero_s:/home/tibero/tibero7]tbboot recovery
Change core dump dir to /home/tibero/tibero7/bin/prof.
Listener port = 8629

Tibero 7

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Tibero instance started up (RECOVERY mode).
```

(4) Active 기동

Active 서버 Normal 모드 기동

```
[tibero@server1:tibero_p:/home/tibero/tibero7]tbcm -b
CM Guard daemon started up.
import resources from '/home/tibero/cm_p/cm_res'...

TBCM 7.1.1 (Build 303837)
```

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Tibero cluster manager started up.
Local node name is (cm_p:11039).

[tibero@server1:tibero_p:/home/tibero/tibero7]tbboot
Change core dump dir to /home/tibero/tibero7/bin/prof.
Listener port = 8629

Tibero 7

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Tibero instance started up (NORMAL mode).

5. TSC 기동/종료 및 TSC 관리

(1) TSC 기동

Observer 기동

```
[observer@server2::/home/observer]tbcmobs -b

TBCM OBSERVER MODE 7.1.1 (Build 303837)

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Tibero cluster manager observer started up.
Local observer name is (cm_obs:21039).
```

Standby 기동 (Recovery 모드)

```
[tibero@server2:tibero_s:/home/tibero]tbcm -b
CM Guard daemon started up.
import resources from '/home/tibero/cm_s/cm_res'...

TBCM 7.1.1 (Build 303837)

TmaxTibero Corporation Copyright (c) 2020-. All rights reserved.

Tibero cluster manager started up.
Local node name is (cm_s:11039).

[tibero@server2:tibero_s:/home/tibero]tbboot recovery
Change core dump dir to /home/tibero/tibero7/bin/prof.
Listener port = 8629

Tibero 7

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Tibero instance started up (RECOVERY mode).
```

Primary 기동 (Normal 모드)

```
[tibero@server1:tibero_p:/home/tibero]tbcm -b
CM Guard daemon started up.
import resources from '/home/tibero/cm_p/cm_res'...

TBCM 7.1.1 (Build 303837)

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Tibero cluster manager started up.
Local node name is (cm_p:11039).

[tibero@server1:tibero_p:/home/tibero]tbboot
Change core dump dir to /home/tibero/tibero7/bin/prof.
Listener port = 8629
```

```
Tibero 7

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Tibero instance started up (NORMAL mode).
```

(2) TSC 종료

Observer 종료

```
[observer@server2::/home/observer]tbcmobs -d
CM DOWN SUCCESS!
```

Primary 종료

```
[tibero@server1:tibero_p:/home/tibero]tbdown immediate

Tibero instance terminated (IMMEDIATE mode).

[tibero@server1:tibero_p:/home/tibero]tbcm -d
CM DOWN SUCCESS!
```

Standby 종료

```
[tibero@server2:tibero_s:/home/tibero]tbdown immediate

Tibero instance terminated (IMMEDIATE mode).

[tibero@server2:tibero_s:/home/tibero]tbcm -d
CM DOWN SUCCESS!
```

(3) TSC 상태확인

Observer에서 확인

```
[observer@server2::/home/observer]cmrctl show
Resource List of Observer cm_obs
============================================================
 TSC_ID    CLS_ID     CM_NAME     NID    CM_STAT    INST_STAT    PRI/TAR
-------- -------- ---------- ----- --------- ---------- ---------
      11        2          cm_s       1          UP      UP(RECO)     TARGET
                1          cm_p       1          UP      UP(NRML)     PRIMARY
============================================================
[observer@server2::/home/observer]cmrctl show --tscid 11
TSC(ID: 11) Information
================================================================================================
 FAILOVER          MODE          CLS_ID     CM_NAME     CONN    LOG      Heartbeat              RCVD.TSN
---------- ------------- -------- ---------- ------ ----- ------------ --------------------
   ON(TSN)         PROTECTIVE          2          cm_s     Y(M)       1              60                   46068
                                       1          cm_p     Y(M)     -                60                       0
================================================================================================
[observer@server2::/home/observer]cmrctl show --tscid 11
```

```
TSC(ID: 11) Information
================================================================================
 FAILOVER          MODE          CLS_ID     CM_NAME      CONN    LOG      Heartbeat              RCVD.TSN
--------- ------------- -------- ---------- ------ ----- ------------ --------------------
   ON(TSN)         PROTECTIVE          2          cm_s     Y(M)       1              60                 46128
                                       1          cm_p     Y(M)     -                60                     0
================================================================================
```

cmrctl show를 통하여 tscid와 primary, target 서버를 알 수 있습니다.

cmrctl show --tscid <tscid>를 통하여 failover, mode, tsn 동기화 상태 등을 확인할 수 있습니다.

Primary에서 확인

```
SQL> select * from v$standby_dest;

STANDBY_ADDR                            TYPE                           THREAD#
------------------------------ -------------------- ----------
FLAGS                          SENT_SEQ SENT_BLKNO   ACKED_SEQ ACKED_BLKNO          DELAY
-------------------- ---------- ---------- ---------- ---------- ----------
192.168.182.129:8633                LGWR ASYNC MAIN                    0
CONNECTED                                9         13          9         13          0


1 row selected.
```

Standby에서 확인

```
SQL> alter database open read only continue recovery;

Database altered.

SQL> select PRIMARY_ADDR, STATUS, PRIMARY_TSN, RECVED_TSN, RECOVERED_TSN from v$standby;

PRIMARY_ADDR                            STATUS
------------------------------ ----------------------------------------
PRIMARY_TSN RECVED_TSN RECOVERED_TSN
----------- ---------- -------------
192.168.182.128:43340               READ-ONLY STANDBY, RECOVERY IN PROGRESS
          46129          46128              46128

1 row selected.

SQL> alter database standby;

Database altered.
```

Standby 서버에서 확인하기 위해서는 read only로 변경하여 확인 후, standby로 원복합니다.