TR-5007：透過Google Cloud NetApp Volumes上的伺服器內增量合併優化 Oracle VLDB 備份與還原

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該解決方案提供了部署到 Google Compute Engine VM 的 Oracle VLDB 的概述和詳細信息，該 VM 透過在Google Cloud NetApp Volumes儲存池上掛載 NFS 來快速恢復，以暫存透過 RMAN 不斷增量合併的備用資料庫副本。

目的

使用 Oracle 復原管理器 (RMAN) 備份工具還原 Oracle 中的超大型資料庫 (VLDB) 可能是一項極具挑戰性的任務。發生故障時從備份媒體還原資料庫的過程可能非常耗時，從而延遲資料庫復原並可能嚴重影響您的服務等級協定 (SLA)。由於成本考慮，RMAN 備份通常串流傳輸到物件存儲，因此對於部署在雲端的 Oracle VLDB 來說，情況變得更加糟糕。因此，如果 SLA 必不可少，則恢復和恢復 VLDB 是不可行的。從 10g 版本開始，Oracle 引入了 RMAN 功能，允許使用者在資料庫伺服器主機上的附加磁碟儲存上建立 Oracle 資料庫資料檔案的分階段映像副本。這些影像副本可以使用 RMAN 依照使用者定義的間隔進行增量更新。如果發生故障，資料庫管理員 (DBA) 可以迅速將 Oracle 資料庫從故障媒體切換到映像副本，從而無需進行完整的資料庫媒體還原。儘管所需的資料庫儲存量增加了一倍，但其結果是 SLA 得到了極大改善。

如果您熱衷於 VLDB 的 SLA 並考慮將 Oracle 資料庫遷移到 Google Cloud Platform (GCP) 等公有雲，則可以使用Google Cloud NetApp Volumes (GCNV) 等資源設定類似的資料庫保護結構來暫存備用資料庫映像副本。GCNV 是 Google 提供的完全託管的高效能文件儲存服務，它使在 Google Cloud 中遷移和運行要求嚴格的企業應用程式（例如 Oracle 資料庫）變得更容易、更安全、更有經濟。其多樣化的服務等級允許靈活地控制儲存成本，同時實現接近零的 RPO 和可管理的 RTO。在本文檔中，我們示範如何從 GCNV 儲存池配置和匯出 NFS 檔案系統，並將其掛載到 Oracle 資料庫伺服器上，以便在主儲存發生故障時暫存備用資料庫副本以便快速復原。

此解決方案適用於以下用例：

- Oracle 資料庫資料檔案映像透過 RMAN 複製備份到Google Cloud NetApp Volumes儲存池上的伺服器內 NFS 檔案系統。
- 當同一台或備用 Google Compute Engine VM 發生故障時，可以快速復原 Oracle VLDB。
- 在幾分鐘內從暫存資料庫映像副本複製主機上的 Oracle 資料庫副本以供其他用例使用。

對象

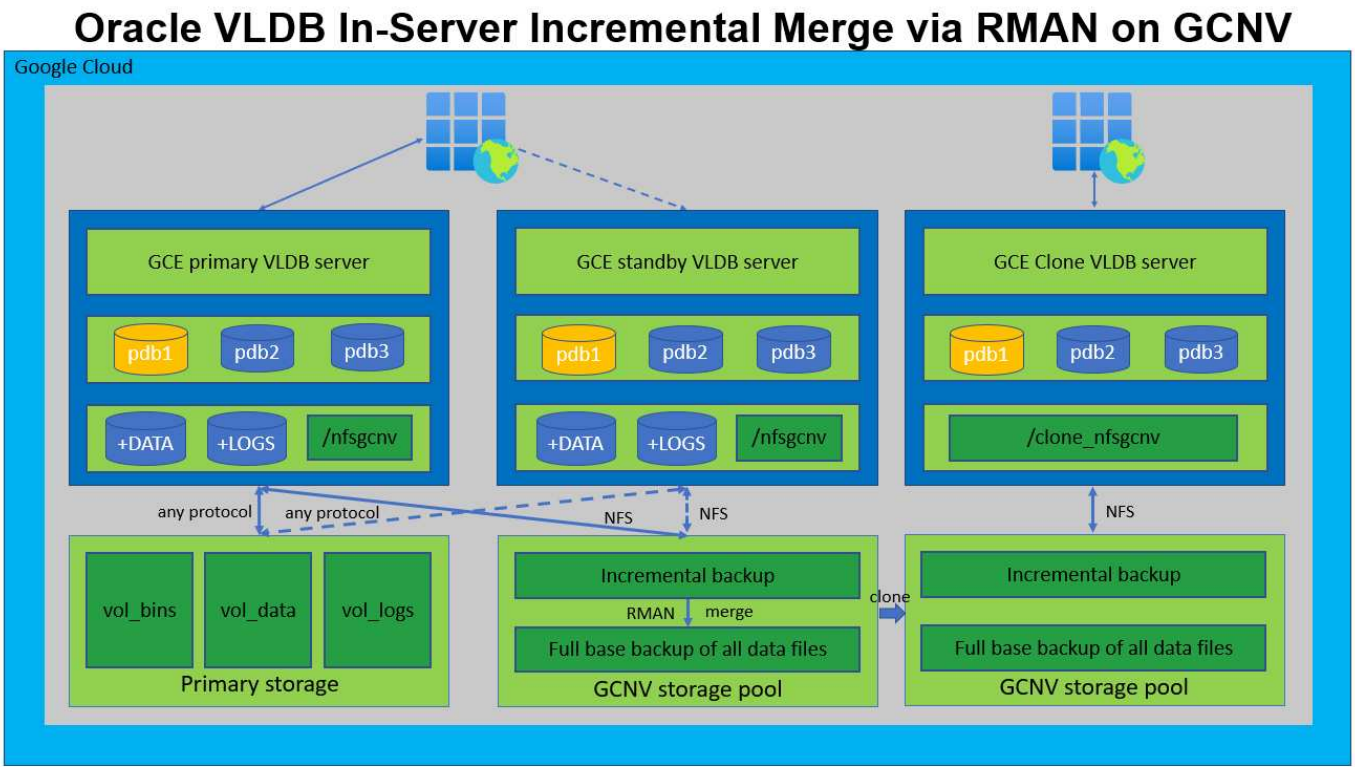
此解決方案適用於以下人群：

- 在 Google Cloud Platform 中設定和管理 Oracle VLDB 的 DBA。
- 在 Google Cloud Platform 中測試 Oracle 工作負載的資料庫解決方案架構師。
- 管理部署到 GCNV 儲存池的 Oracle 資料庫的儲存管理員。
- 希望在 Google Cloud Platform 中建立 Oracle 資料庫的應用程式擁有者。

解決方案測試和驗證環境

此解決方案的測試和驗證是在Google Cloud NetApp Volumes儲存池和 Google Compute Engine VM 中執行的，這些儲存池和虛擬機器可能與最終部署環境不符。有關更多信息，請參閱[部署考慮的關鍵因素] 。

架構



硬體和軟體組件

硬體		
Google Cloud NetApp Volumes儲存池	Google 目前提供的服務	進階服務 2 TiB 儲存池，標準服務 2 TiB 儲存池
用於資料庫伺服器的 Google Compute Engine VM	N1（4 個 vCPU，15 GiB 記憶體）	2 個虛擬機，一個作為主資料庫伺服器，另一個作為備用或克隆資料庫伺服器
軟體		
紅帽Linux	Red Hat Enterprise Linux 8.10（Ootpa）- x86/64	RHEL 市場圖像，PAYG
Oracle 網格基礎架構	版本 19.18	已套用RU補丁p34762026_190000_Linux-x86-64.zip
Oracle 資料庫	版本 19.18	已套用RU補丁p34765931_190000_Linux-x86-64.zip

dNFS一次性補丁	p32931941_190000_Linux-x86-64.zip	適用於網格和資料庫
Oracle OPatch	版本 12.2.0.1.36	最新補丁 p6880880_190000_Linux-x86-64.zip
NFS	版本 3.0	已啟用 Oracle dNFS
Ansible	版本核心 2.16.2	python版本-3.10.13

部署考慮的關鍵因素

- *GCNV 儲存池服務等級。 * GCNV儲存池提供四種服務等級：Standard、Premium、Extreme和Flex。預設情況下，自動 QoS 適用於儲存池內建立的捲，它會根據磁碟區的大小和服務等級限製卷的吞吐量。唯一的例外是，從 Flex 儲存池指派的磁碟區共用儲存池可用的吞吐量。
- *RMAN 增量合併的 Oracle VLDB 伺服器內備份儲存限制。 *在我們的測試和驗證中，用於 Oracle 增量備份和合併的 NFS 磁碟區是從具有標準服務等級的單一 GCNV 儲存池中分配的，該儲存池的容量限制為 200 TiB。對於超過該閾值的部署，可以並行實作多個 GCNV 儲存池和多個 NFS 掛載點，以提供更高的容量。
- *使用 RMAN 增量合併實作 Oracle 可恢復性。 * RMAN 伺服器內增量備份和合併通常會根據您的 RTO 和 RPO 目標以使用者定義的頻率執行。如果主資料庫檔案儲存和/或歸檔日誌完全遺失，則可能會發生資料遺失。 Oracle 資料庫可以從伺服器內的資料庫備份映像副本還原到最新的可用增量備份。為了最大限度地減少資料遺失，需要在 GCNV NFS 備份掛載點上設定 Oracle 閃回復原區，並將存檔日誌與資料庫映像副本一起備份到同一個 NFS 掛載點，以便在發生故障時將資料庫前滾到最後的存檔日誌。因此，可以實現接近零的 RPO。
- *在 GCNV 儲存池上從 NFS 映像備份執行 Oracle VLDB。 *目前，不支援將資料庫磁碟區服務等級從標準重新分配為高級或極端。但是，支援將服務等級從高級重新分配到極致。為了在發生故障後長時間在映像副本上執行資料庫，建議從進階儲存池中指派磁碟區以用於資料庫映像副本備份。
- *Google Compute Engine 虛擬機器。 *在測試驗證中，我們使用N1類型的GCE VM實例作為Oracle資料庫伺服器。其他類型的 GCE VM 可能更優化，更適合資料庫工作負載。根據實際工作負載要求，適當調整虛擬機器的 vCPU 數量和 RAM 容量。
- *dNFS 配置。 * dNFS 內建於 Oracle 核心中，並且已知當 Oracle 部署到 NFS 儲存時可顯著提高 Oracle 資料庫效能。 dNFS 打包到 Oracle 二進位檔案中，但預設未開啟。對於 NFS 上的任何 Oracle 資料庫部署，都應該啟用它。對於 VLDB 的多個 GCNV 儲存池部署，應正確配置到不同 GCNV 儲存池的 dNFS 多路徑。

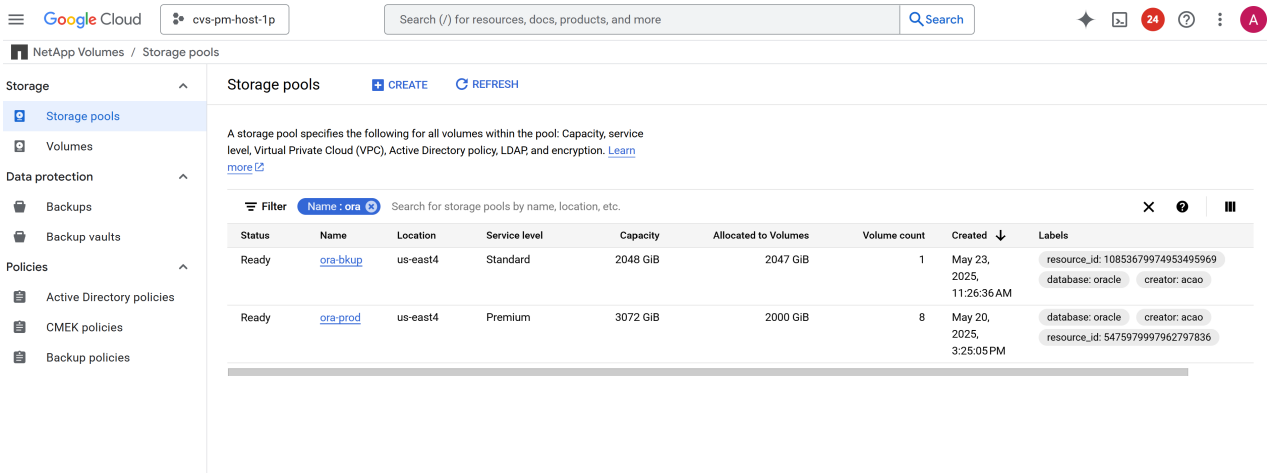
解決方案部署

此解決方案假定 Oracle VLDB 已部署在 VPC 內的 Google Cloud 環境中。 Oracle VLDB 可以在 GCNV 儲存或 Google Cloud 生態系統內的任何其他儲存選項上運作。以下部分提供了設定 Oracle VLDB 映像備份並透過 RMAN 增量合併到從 GCNV 儲存池掛載的 NFS 檔案系統的逐步部署程序。 Oracle VLDB 的主儲存也託管在不同的 GCNV 儲存池中。

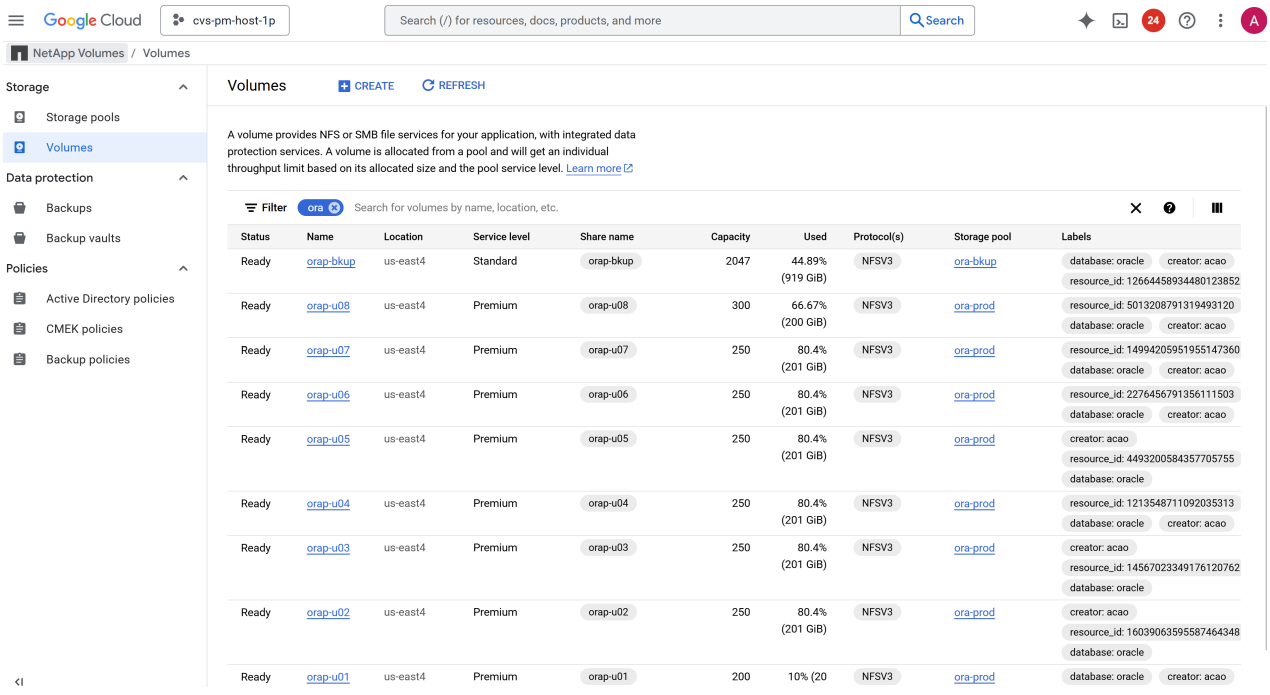
部署先決條件

部署需要以下先決條件。

1. 已設定 GCP 帳戶，並在 Google Cloud 帳戶中的專案內建立了必要的 VPC 和網路配置。
2. 在 Google Cloud 入口網站控制台中，依照文件操作"建立儲存池"建立一個具有標準服務的GCNV儲存池，如下所示。



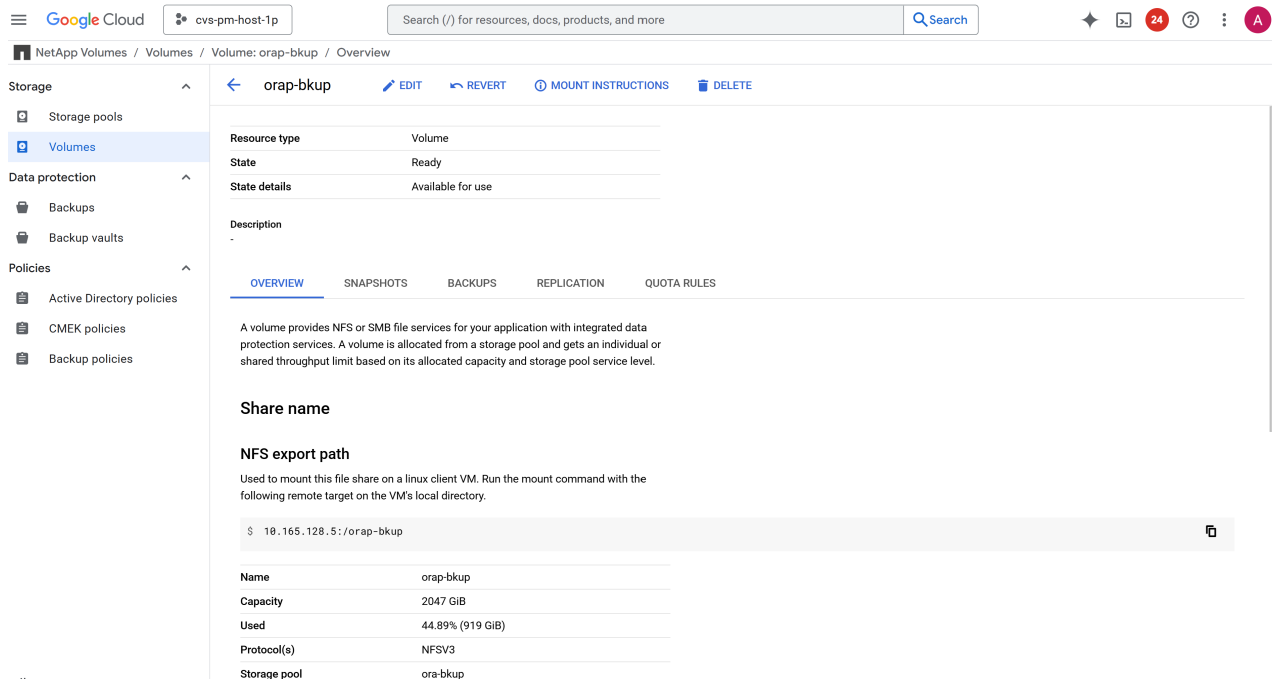
3. 在 Google Cloud 入口網站控制台中，依照文件操作"創建卷"為伺服器內 Oracle VLDB 映像備份建立磁碟區。在此解決方案演示中，Oracle VLDB 主儲存也託管在 GCNV 上，如下所示。



將 NFS 磁碟區從 GCNV 掛載到主 Oracle VLDB 伺服器

為了獲得更好的效能，為 Oracle VLDB 伺服器內備份配置的 GCNV 磁碟區理想情況下應位於與主資料庫伺服器和主儲存相同的 Google Cloud 區域。

1. 從 Google Cloud 控制台擷取 GCNV 磁碟區 NFS 匯出路徑。



2. 登入主 Oracle VLDB 伺服器。以 root 身分掛載從 GCNV 儲存導出的 NFS 磁碟區。根據需要變更為您的 NFS 伺服器 IP 位址和檔案路徑。

```
sudo mkdir /nfsgcnv
```

```
mount 10.165.128.5:/orap-bkup /nfsgcnv -o
rw,bg,hard,vers=3,proto=tcp,timeo=600,rsize=262144,wsize=262144
```

3. 將掛載點所有權更改為 oracle:oisntall，或根據需要更改為您的 oracle 使用者名稱和主要群組。

```
sudo chown oracle:oinstall /nfsgcnv
```

4. 將 NFS 掛載新增至 /etc/fstab。

```
sudo vi /etc/fstab
```

設定 Oracle RMAN 增量合併到 GCNV 上的映像副本，以進行伺服器內 VLDB 備份

RMAN 增量合併在每個增量備份/合併間隔持續更新暫存資料庫資料檔案映像副本。資料庫備份的映像副本將與您執行增量備份/合併的頻率一樣最新。因此，在決定 RMAN 增量備份和合併的頻率時，請考慮資料庫效能、RTO 和 RPO 目標。

1. 以 oracle 使用者登入主 Oracle VLDB 伺服器。
2. 為了驗證此解決方案，主資料庫設定為具有網格基礎架構重新啟動配置的獨立伺服器，如下所示。主儲存託管在提供優質服務的 GCNV 儲存池上。再次強調，這不是必需的，主儲存可以是 Google 雲端中的任何其他儲存選項。

```
[oracle@orap ~]$ df -h
Filesystem                Size  Used Avail Use% Mounted on
devtmpfs                  7.2G     0  7.2G   0% /dev
tmpfs                     7.3G  1.1G  6.2G  16% /dev/shm
tmpfs                     7.3G  8.5M  7.2G   1% /run
tmpfs                     7.3G     0  7.3G   0% /sys/fs/cgroup
/dev/sda2                  50G   22G   29G  43% /
/dev/sda1                 200M  5.9M  194M   3% /boot/efi
10.165.128.5:/orap-u02    250G  203G   48G  81% /u02
10.165.128.5:/orap-u07    250G  203G   48G  82% /u07
10.165.128.5:/orap-u06    250G  203G   48G  81% /u06
10.165.128.5:/orap-u04    250G  203G   48G  81% /u04
10.165.128.5:/orap-u05    250G  203G   48G  82% /u05
10.165.128.5:/orap-bkup   2.0T  918G  1.2T  45% /nfsgcnv
10.165.128.5:/orap-u03    250G  202G   49G  81% /u03
10.165.128.4:/orap-u01    200G   21G  180G  11% /u01
10.165.128.5:/orap-u08    300G  201G  100G  67% /u08
tmpfs                     1.5G     0  1.5G   0% /run/user/54321

[oracle@orap ~]$ crsctl stat res -t
--------------------------------------------------------------------------------
------------
Name           Target  State        Server                   State
details
--------------------------------------------------------------------------------
------------
Local Resources
--------------------------------------------------------------------------------
------------
ora.DATA.dg
               ONLINE  ONLINE       orap                     STABLE
ora.LISTENER.lsnr
               ONLINE  ONLINE       orap                     STABLE
ora.LOGS.dg
               ONLINE  ONLINE       orap                     STABLE
ora.asm
```

```
               ONLINE  ONLINE       orap
Started,STABLE
ora.ons
               OFFLINE OFFLINE      orap                     STABLE
--------------------------------------------------------------------------------
------------
Cluster Resources
--------------------------------------------------------------------------------
------------
ora.cssd
      1        ONLINE  ONLINE       orap                     STABLE
ora.diskmon
      1        OFFLINE OFFLINE                               STABLE
ora.evmd
      1        ONLINE  ONLINE       orap                     STABLE
ora.ntap.db
      1        ONLINE  ONLINE       orap
Open,HOME=/u01/app/o

racle/product/19.0.0

/NTAP,STABLE
--------------------------------------------------------------------------------
------------


[oracle@orap ~]$ asmcmd
ASMCMD> lsdg
State    Type    Rebal  Sector  Logical_Sector  Block       AU
Total_MB  Free_MB  Req_mir_free_MB  Usable_file_MB  Offline_disks
Voting_files  Name
MOUNTED  EXTERN  N         512             512   4096  4194304
1228800  1150288                0         1150288              0
N  DATA/
MOUNTED  EXTERN  N         512             512   4096  4194304
204800   204636                0          204636              0
N  LOGS/
ASMCMD> lsdsk
Path
/u02/oradata/asm/orap_data_disk_01
/u02/oradata/asm/orap_data_disk_02
/u02/oradata/asm/orap_data_disk_03
/u02/oradata/asm/orap_data_disk_04
/u03/oradata/asm/orap_data_disk_05
/u03/oradata/asm/orap_data_disk_06
/u03/oradata/asm/orap_data_disk_07
```

```
/u03/oradata/asm/orap_data_disk_08
/u04/oradata/asm/orap_data_disk_09
/u04/oradata/asm/orap_data_disk_10
/u04/oradata/asm/orap_data_disk_11
/u04/oradata/asm/orap_data_disk_12
/u05/oradata/asm/orap_data_disk_13
/u05/oradata/asm/orap_data_disk_14
/u05/oradata/asm/orap_data_disk_15
/u05/oradata/asm/orap_data_disk_16
/u06/oradata/asm/orap_data_disk_17
/u06/oradata/asm/orap_data_disk_18
/u06/oradata/asm/orap_data_disk_19
/u06/oradata/asm/orap_data_disk_20
/u07/oradata/asm/orap_data_disk_21
/u07/oradata/asm/orap_data_disk_22
/u07/oradata/asm/orap_data_disk_23
/u07/oradata/asm/orap_data_disk_24
/u08/oralogs/asm/orap_logs_disk_01
/u08/oralogs/asm/orap_logs_disk_02
/u08/oralogs/asm/orap_logs_disk_03
/u08/oralogs/asm/orap_logs_disk_04
```

3. 在掛載點 /nfsgcnv 下建立一個 oracopy 目錄來儲存 oracle 資料檔案映像副本，以及一個 archlog 目錄用於 Oracle 閃回復原區。

```
mkdir /nfsgcnv/oracopy
```

```
mkdir /nfsgcnv/archlog
```

4. 透過 sqlplus 登入 Oracle 資料庫，啟用區塊變更追蹤以加快增量備份速度，如果 Oracle 快閃記憶體復原區目前位於主儲存體上，則將其變更為 GCNV NFS 掛載。這允許將 RMAN 預設控製檔/spfile 自動備份和存檔日誌備份到 GCNV NFS 掛載，以便將資料庫還原到最後一個可用的存檔日誌。

```
sqlplus / as sysdba
```

在 sqlplus 提示字元下，執行以下命令。

```
alter database enable block change tracking using file
'/nfsgcnv/oracopy/bct_ntap.ctf'
```

```
alter system set db_recovery_file_dest='/nfsgcnv/archlog/'
scope=both;
```

預期輸出：

```
[oracle@orap ~]$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Wed Mar 20 16:44:21
2024
Version 19.18.0.0.0

Copyright (c) 1982, 2022, Oracle.  All rights reserved.

Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Version 19.18.0.0.0

SQL> alter database enable block change tracking using file
'/nfsgcnv/oracopy/bct_ntap.ctf';

Database altered.

SQL> alter system set db_recovery_file_dest='/nfsgcnv/archlog/'
scope=both;

System altered.

SQL> alter system set db_recovery_file_dest_size = 400G scope=both;

System altered.

SQL> show parameter recover

NAME                                 TYPE        VALUE
------------------------------------ -----------
------------------------------
db_recovery_file_dest                string      /nfsgcnv/archlog/
db_recovery_file_dest_size           big integer 400G
db_unrecoverable_scn_tracking        boolean     TRUE
recovery_parallelism                 integer     0
remote_recovery_file_dest            string
SQL>
```

5. 建立 RMAN 備份和增量合併腳本。該腳本為並行 RMAN 備份和合併分配多個通道。第一次執行將產生初始的完整基線影像副本。在完整運行過程中，它首先清除保留視窗之外的過時備份，以保持暫存區清潔。然後它在合併和備份之前切換當前日誌檔案。增量備份在合併之後進行，因此資料庫映像副本落後於目前資料庫狀態備份/合併週期。可以根據使用者的喜好逆轉合併和備份的順序，以便更快地恢復。RMAN 腳本可以整合到一個簡單的 shell 腳本中，從主 DB 伺服器上的 crontab 執行。確保 RMAN 設定中的控製檔自動備份處於開啟狀態。

```
vi /home/oracle/rman_bkup_merge.cmd

Add following lines:

RUN
{
  allocate channel c1 device type disk format '/nfsgcnv/oracopy/%U';
  allocate channel c2 device type disk format '/nfsgcnv/oracopy/%U';
  allocate channel c3 device type disk format '/nfsgcnv/oracopy/%U';
  allocate channel c4 device type disk format '/nfsgcnv/oracopy/%U';
  delete obsolete;
  sql 'alter system archive log current';
  recover copy of database with tag 'OraCopyBKUPonGCNV_level_0';
  backup incremental level 1 copies=1 for recover of copy with tag
'OraCopyBKUPonGCNV_level_0' database;
}
```

6. 在主 Oracle VLDB 伺服器上，以 oracle 使用者身分本地登入 RMAN，可以使用或不使用 RMAN 目錄。在此示範中，我們沒有連接到 RMAN 目錄。

```
rman target / nocatalog;

output:

[oracle@orap ~]$ rman target / nocatalog

Recovery Manager: Release 19.0.0.0.0 - Production on Wed Mar 20
16:54:24 2024
Version 19.18.0.0.0

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reserved.

connected to target database: NTAP (DBID=1379265854)
using target database control file instead of recovery catalog
```

7. 從 RMAN 提示字元執行腳本。第一次執行會建立基準資料庫映像副本，後續執行則會逐步合併和更新基準映像副本。以下是如何執行腳本以及典型的輸出。設定通道數以符合主機上的 CPU 核心。

```
RMAN> @/home/oracle/rman_bkup_merge.cmd

RMAN> RUN
2> {
3>   allocate channel c1 device type disk format
'/nfsgcnv/oracopy/%U';
4>   allocate channel c2 device type disk format
'/nfsgcnv/oracopy/%U';
5>   allocate channel c3 device type disk format
'/nfsgcnv/oracopy/%U';
6>   allocate channel c4 device type disk format
'/nfsgcnv/oracopy/%U';
7>   delete obsolete;
8>   sql 'alter system archive log current';
9>   recover copy of database with tag 'OraCopyBKUPonGCNV_level_0';
10>   backup incremental level 1 copies=1 for recover of copy with
tag 'OraCopyBKUPonGCNV_level_0' database;
11> }
allocated channel: c1
channel c1: SID=23 device type=DISK

allocated channel: c2
channel c2: SID=151 device type=DISK

allocated channel: c3
channel c3: SID=20 device type=DISK

allocated channel: c4
channel c4: SID=150 device type=DISK

RMAN retention policy will be applied to the command
RMAN retention policy is set to redundancy 1
Deleting the following obsolete backups and copies:
Type                 Key    Completion Time    Filename/Handle
-------------------- ------ ------------------ --------------------
Backup Set           1      22-MAY-25
  Backup Piece       1      22-MAY-25
+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201793914.260.1201793917
Backup Set           2      22-MAY-25
  Backup Piece       2      22-MAY-25
+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201795422.261.1201795425
Backup Set           3      22-MAY-25
  Backup Piece       3      22-MAY-25
+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201797230.262.1201797231
Backup Set           4      22-MAY-25
  Backup Piece       4      22-MAY-25
```

```
+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201799039.264.1201799041
Backup Set           5      22-MAY-25
  Backup Piece       5      22-MAY-25
+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201802655.265.1201802659
Backup Set           6      22-MAY-25
  Backup Piece       6      22-MAY-25
+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201803558.266.1201803561
Backup Set           7      22-MAY-25
  Backup Piece       7      22-MAY-25
+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201805066.267.1201805069
Backup Set           8      22-MAY-25
  Backup Piece       8      22-MAY-25
+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201806272.268.1201806275
Backup Set           9      22-MAY-25
  Backup Piece       9      22-MAY-25
+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201807778.269.1201807781
Backup Set           10     23-MAY-25
  Backup Piece       10     23-MAY-25
+LOGS/NTAP/AUTOBACKUP/2025_05_23/s_1201874668.271.1201874669
deleted backup piece
backup piece
handle=+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201793914.260.1201793917
RECID=1 STAMP=1201793917
deleted backup piece
backup piece
handle=+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201799039.264.1201799041
RECID=4 STAMP=1201799040
deleted backup piece
backup piece
handle=+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201795422.261.1201795425
RECID=2 STAMP=1201795424
deleted backup piece
backup piece
handle=+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201803558.266.1201803561
RECID=6 STAMP=1201803561
deleted backup piece
backup piece
handle=+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201797230.262.1201797231
RECID=3 STAMP=1201797231
deleted backup piece
backup piece
handle=+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201802655.265.1201802659
RECID=5 STAMP=1201802658
deleted backup piece
backup piece
handle=+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201805066.267.1201805069
```

```
RECID=7 STAMP=1201805069
Deleted 2 objects

deleted backup piece
backup piece
handle=+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201806272.268.1201806275
RECID=8 STAMP=1201806275
Deleted 3 objects

deleted backup piece
backup piece
handle=+LOGS/NTAP/AUTOBACKUP/2025_05_22/s_1201807778.269.1201807781
RECID=9 STAMP=1201807780
Deleted 2 objects

deleted backup piece
backup piece
handle=+LOGS/NTAP/AUTOBACKUP/2025_05_23/s_1201874668.271.1201874669
RECID=10 STAMP=1201874669
Deleted 3 objects


sql statement: alter system archive log current

Starting recover at 23-MAY-25
no copy of datafile 1 found to recover
no copy of datafile 3 found to recover
no copy of datafile 4 found to recover
no copy of datafile 5 found to recover
no copy of datafile 6 found to recover
no copy of datafile 7 found to recover
no copy of datafile 8 found to recover
no copy of datafile 9 found to recover
no copy of datafile 10 found to recover
no copy of datafile 11 found to recover
no copy of datafile 12 found to recover
no copy of datafile 13 found to recover
no copy of datafile 14 found to recover
no copy of datafile 15 found to recover
no copy of datafile 16 found to recover
no copy of datafile 17 found to recover
no copy of datafile 18 found to recover
no copy of datafile 19 found to recover
no copy of datafile 20 found to recover
no copy of datafile 21 found to recover
no copy of datafile 22 found to recover
```

```
no copy of datafile 23 found to recover
no copy of datafile 24 found to recover
no copy of datafile 25 found to recover
no copy of datafile 26 found to recover
no copy of datafile 27 found to recover
no copy of datafile 28 found to recover
no copy of datafile 29 found to recover
no copy of datafile 30 found to recover
no copy of datafile 31 found to recover
no copy of datafile 32 found to recover
no copy of datafile 33 found to recover
no copy of datafile 34 found to recover
no copy of datafile 35 found to recover
no copy of datafile 36 found to recover
no copy of datafile 37 found to recover
no copy of datafile 38 found to recover
no copy of datafile 39 found to recover
no copy of datafile 40 found to recover
no copy of datafile 41 found to recover
no copy of datafile 42 found to recover
no copy of datafile 43 found to recover
no copy of datafile 44 found to recover
no copy of datafile 45 found to recover
no copy of datafile 46 found to recover
no copy of datafile 47 found to recover
no copy of datafile 48 found to recover
no copy of datafile 49 found to recover
no copy of datafile 50 found to recover
Finished recover at 23-MAY-25

Starting backup at 23-MAY-25
no parent backup or copy of datafile 1 found
no parent backup or copy of datafile 3 found
no parent backup or copy of datafile 4 found
no parent backup or copy of datafile 7 found
no parent backup or copy of datafile 6 found
no parent backup or copy of datafile 5 found
no parent backup or copy of datafile 8 found
no parent backup or copy of datafile 21 found
no parent backup or copy of datafile 22 found
no parent backup or copy of datafile 25 found
no parent backup or copy of datafile 28 found
no parent backup or copy of datafile 32 found
no parent backup or copy of datafile 33 found
no parent backup or copy of datafile 36 found
no parent backup or copy of datafile 41 found
```

```
no parent backup or copy of datafile 44 found
no parent backup or copy of datafile 46 found
no parent backup or copy of datafile 10 found
no parent backup or copy of datafile 9 found
no parent backup or copy of datafile 11 found
no parent backup or copy of datafile 12 found
no parent backup or copy of datafile 23 found
no parent backup or copy of datafile 26 found
no parent backup or copy of datafile 29 found
no parent backup or copy of datafile 30 found
no parent backup or copy of datafile 34 found
no parent backup or copy of datafile 37 found
no parent backup or copy of datafile 39 found
no parent backup or copy of datafile 42 found
no parent backup or copy of datafile 47 found
no parent backup or copy of datafile 48 found
no parent backup or copy of datafile 14 found
no parent backup or copy of datafile 13 found
no parent backup or copy of datafile 15 found
no parent backup or copy of datafile 16 found
no parent backup or copy of datafile 24 found
no parent backup or copy of datafile 27 found
no parent backup or copy of datafile 31 found
no parent backup or copy of datafile 35 found
no parent backup or copy of datafile 38 found
no parent backup or copy of datafile 40 found
no parent backup or copy of datafile 43 found
no parent backup or copy of datafile 45 found
no parent backup or copy of datafile 49 found
no parent backup or copy of datafile 50 found
no parent backup or copy of datafile 18 found
no parent backup or copy of datafile 17 found
no parent backup or copy of datafile 19 found
no parent backup or copy of datafile 20 found
channel c1: starting datafile copy
input datafile file number=00021
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.286.1
201793019
channel c2: starting datafile copy
input datafile file number=00022
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.287.1
201793419
channel c3: starting datafile copy
input datafile file number=00025
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.290.1
201794401
```

```
channel c4: starting datafile copy
input datafile file number=00028
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.293.1
201795271
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE1_FNO-28_0f3q6gvn tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=4
STAMP=1201886858
channel c4: datafile copy complete, elapsed time: 01:19:26
channel c4: starting datafile copy
input datafile file number=00032
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.297.1
201797351
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE1_FNO-25_0e3q6gvn tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=5
STAMP=1201886918
channel c3: datafile copy complete, elapsed time: 01:20:21
channel c3: starting datafile copy
input datafile file number=00033
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.298.1
201800805
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE1_FNO-21_0c3q6gvm tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=6
STAMP=1201886943
channel c1: datafile copy complete, elapsed time: 01:20:50
channel c1: starting datafile copy
input datafile file number=00036
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.301.1
201801969
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE1_FNO-22_0d3q6gvm tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=7
STAMP=1201887138
channel c2: datafile copy complete, elapsed time: 01:24:05
channel c2: starting datafile copy
input datafile file number=00041
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.306.1
201803399
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE1_FNO-32_0g3q6lkl tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=8
STAMP=1201891753
channel c4: datafile copy complete, elapsed time: 01:21:26
channel c4: starting datafile copy
input datafile file number=00044
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.309.1
201804651
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE1_FNO-36_0i3q6ln9 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=9
```

```
STAMP=1201891755
channel c1: datafile copy complete, elapsed time: 01:20:03
channel c1: starting datafile copy
input datafile file number=00046
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.312.1
201806095
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE1_FNO-33_0h3q6lmf tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=10
STAMP=1201891766
channel c3: datafile copy complete, elapsed time: 01:20:44
channel c3: starting datafile copy
input datafile file number=00023
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.288.1
201793535
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE1_FNO-41_0j3q6ltd tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=11
STAMP=1201892161
channel c2: datafile copy complete, elapsed time: 01:23:37
channel c2: starting datafile copy
input datafile file number=00026
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.291.1
201795153
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE2_FNO-23_0m3q6qdr tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=12
STAMP=1201896617
channel c3: datafile copy complete, elapsed time: 01:20:53
channel c3: starting datafile copy
input datafile file number=00029
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.294.1
201796261
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE1_FNO-46_0l3q6qdc tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=13
STAMP=1201896650
channel c1: datafile copy complete, elapsed time: 01:21:35
channel c1: starting datafile copy
input datafile file number=00030
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.295.1
201797317
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE1_FNO-44_0k3q6qdc tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=14
STAMP=1201896694
channel c4: datafile copy complete, elapsed time: 01:22:20
channel c4: starting datafile copy
input datafile file number=00034
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.300.1
201800829
```

```
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE2_FNO-26_0n3q6qq7 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=15
STAMP=1201897015
channel c2: datafile copy complete, elapsed time: 01:20:53
channel c2: starting datafile copy
input datafile file number=00037
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.302.1
201802025
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE2_FNO-30_0p3q6v6b tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=16
STAMP=1201901480
channel c1: datafile copy complete, elapsed time: 01:20:37
channel c1: starting datafile copy
input datafile file number=00039
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.304.1
201803375
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE2_FNO-29_0o3q6v5h tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=17
STAMP=1201901527
channel c3: datafile copy complete, elapsed time: 01:21:48
channel c3: starting datafile copy
input datafile file number=00042
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.307.1
201804601
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE2_FNO-34_0q3q6v7o tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=18
STAMP=1201901805
channel c4: datafile copy complete, elapsed time: 01:25:14
channel c4: starting datafile copy
input datafile file number=00047
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.311.1
201806051
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE2_FNO-37_0r3q6vhu tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=19
STAMP=1201901963
channel c2: datafile copy complete, elapsed time: 01:22:23
channel c2: starting datafile copy
input datafile file number=00048
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.313.1
201873549
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE2_FNO-39_0s3q73th tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=20
STAMP=1201906343
channel c1: datafile copy complete, elapsed time: 01:20:55
channel c1: starting datafile copy
input datafile file number=00024
```

```
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.289.1
201793665
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE2_FNO-42_0t3q73uv tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=21
STAMP=1201906415
channel c3: datafile copy complete, elapsed time: 01:21:24
channel c3: starting datafile copy
input datafile file number=00027
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.292.1
201795207
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE2_FNO-47_0u3q747i tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=22
STAMP=1201906737
channel c4: datafile copy complete, elapsed time: 01:22:15
channel c4: starting datafile copy
input datafile file number=00031
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.296.1
201797343
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE2_FNO-48_0v3q74cd tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=23
STAMP=1201906865
channel c2: datafile copy complete, elapsed time: 01:21:45
channel c2: starting datafile copy
input datafile file number=00035
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.299.1
201800821
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE3_FNO-24_103q78l8 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=24
STAMP=1201911205
channel c1: datafile copy complete, elapsed time: 01:21:03
channel c1: starting datafile copy
input datafile file number=00038
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.303.1
201802375
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE3_FNO-27_113q78nk tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=25
STAMP=1201911367
channel c3: datafile copy complete, elapsed time: 01:22:33
channel c3: starting datafile copy
input datafile file number=00040
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.305.1
201803381
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE3_FNO-31_123q791p tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=26
STAMP=1201911632
channel c4: datafile copy complete, elapsed time: 01:21:33
```

```
channel c4: starting datafile copy
input datafile file number=00043
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.308.1
201804629
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE3_FNO-35_133q795m tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=27
STAMP=1201911835
channel c2: datafile copy complete, elapsed time: 01:22:57
channel c2: starting datafile copy
input datafile file number=00045
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.310.1
201806031
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE3_FNO-38_143q7dd7 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=28
STAMP=1201916184
channel c1: datafile copy complete, elapsed time: 01:23:06
channel c1: starting datafile copy
input datafile file number=00049
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.314.1
201873563
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE3_FNO-40_153q7did tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=29
STAMP=1201916197
channel c3: datafile copy complete, elapsed time: 01:20:24
channel c3: starting datafile copy
input datafile file number=00050
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.315.1
201875477
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE3_FNO-43_163q7dqp tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=30
STAMP=1201916471
channel c4: datafile copy complete, elapsed time: 01:20:40
channel c4: starting datafile copy
input datafile file number=00001
name=+DATA/NTAP/DATAFILE/system.257.1201727295
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-1_1a3q7ii2 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=31
STAMP=1201916673
channel c4: datafile copy complete, elapsed time: 00:03:15
channel c4: starting datafile copy
input datafile file number=00003
name=+DATA/NTAP/DATAFILE/sysaux.258.1201727339
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE3_FNO-45_173q7e17 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=32
STAMP=1201916703
channel c2: datafile copy complete, elapsed time: 01:21:05
```

```
channel c2: starting datafile copy
input datafile file number=00004
name=+DATA/NTAP/DATAFILE/undotbs1.259.1201727365
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
UNDOTBS1_FNO-4_1c3q7ipa tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=33
STAMP=1201916821
channel c2: datafile copy complete, elapsed time: 00:01:55
channel c2: starting datafile copy
input datafile file number=00010
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/sysaux.273
.1201729255
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-3_1b3q7io5 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=34
STAMP=1201916851
channel c4: datafile copy complete, elapsed time: 00:02:58
channel c4: starting datafile copy
input datafile file number=00014
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/sysaux.278
.1201729279
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-10_1d3q7isu tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=35
STAMP=1201916936
channel c2: datafile copy complete, elapsed time: 00:01:52
channel c2: starting datafile copy
input datafile file number=00018
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/sysaux.283
.1201729301
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-14_1e3q7itp tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=36
STAMP=1201916940
channel c4: datafile copy complete, elapsed time: 00:01:25
channel c4: starting datafile copy
input datafile file number=00006
name=+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/sysaux.267
.1201728307
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-6_1g3q7j0e tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=37
STAMP=1201917017
channel c4: datafile copy complete, elapsed time: 00:01:25
channel c4: starting datafile copy
input datafile file number=00009
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/system.272
.1201729255
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-18_1f3q7j0e tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=38
STAMP=1201917035
```

```
channel c2: datafile copy complete, elapsed time: 00:01:34
channel c2: starting datafile copy
input datafile file number=00013
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/system.277
.1201729279
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-9_1h3q7j35 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=39
STAMP=1201917090
channel c4: datafile copy complete, elapsed time: 00:01:03
channel c4: starting datafile copy
input datafile file number=00017
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/system.282
.1201729301
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-13_1i3q7j3d tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=40
STAMP=1201917097
channel c2: datafile copy complete, elapsed time: 00:01:00
channel c2: starting datafile copy
input datafile file number=00005
name=+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/system.266
.1201728307
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-5_1k3q7j5a tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=42
STAMP=1201917174
channel c2: datafile copy complete, elapsed time: 00:01:25
channel c2: starting datafile copy
input datafile file number=00011
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/undotbs1.2
71.1201729255
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-17_1j3q7j56 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=41
STAMP=1201917174
channel c4: datafile copy complete, elapsed time: 00:01:31
channel c4: starting datafile copy
input datafile file number=00008
name=+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/undotbs1.2
68.1201728307
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
UNDOTBS1_FNO-11_1l3q7j80 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=44
STAMP=1201917237
channel c2: datafile copy complete, elapsed time: 00:00:56
channel c2: starting datafile copy
input datafile file number=00015
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/undotbs1.2
76.1201729279
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
```

```
UNDOTBS1_FNO-8_1m3q7j82 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=43
STAMP=1201917232
channel c4: datafile copy complete, elapsed time: 00:00:55
channel c4: starting datafile copy
input datafile file number=00019
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/undotbs1.2
81.1201729301
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
UNDOTBS1_FNO-15_1n3q7j9p tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=45
STAMP=1201917288
channel c2: datafile copy complete, elapsed time: 00:00:55
channel c2: starting datafile copy
input datafile file number=00007
name=+DATA/NTAP/DATAFILE/users.260.1201727365
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
UNDOTBS1_FNO-19_1o3q7j9p tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=46
STAMP=1201917295
channel c4: datafile copy complete, elapsed time: 00:00:55
channel c4: starting datafile copy
input datafile file number=00012
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/users.275.
1201729277
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
USERS_FNO-7_1p3q7jbg tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=47
STAMP=1201917297
channel c2: datafile copy complete, elapsed time: 00:00:02
channel c2: starting datafile copy
input datafile file number=00016
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/users.280.
1201729301
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
USERS_FNO-12_1q3q7jbh tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=48
STAMP=1201917297
channel c4: datafile copy complete, elapsed time: 00:00:01
channel c4: starting datafile copy
input datafile file number=00020
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/users.285.
1201729323
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
USERS_FNO-16_1r3q7jbi tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=49
STAMP=1201917298
channel c2: datafile copy complete, elapsed time: 00:00:01
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
USERS_FNO-20_1s3q7jbi tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=50
STAMP=1201917298
channel c4: datafile copy complete, elapsed time: 00:00:01
```

```
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE3_FNO-50_193q7i95 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=51
STAMP=1201919158
channel c3: datafile copy complete, elapsed time: 00:49:26
output file name=/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SOE3_FNO-49_183q7i95 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=52
STAMP=1201919167
channel c1: datafile copy complete, elapsed time: 00:49:36
Finished backup at 24-MAY-25

Starting Control File and SPFILE Autobackup at 24-MAY-25
piece
handle=/nfsgcnv/archlog/NTAP/autobackup/2025_05_24/o1_mf_s_120191917
3_n32cl775_.bkp comment=NONE
Finished Control File and SPFILE Autobackup at 24-MAY-25
released channel: c1
released channel: c2
released channel: c3
released channel: c4

RMAN> **end-of-file**

RMAN>
```

8. 列出備份後的資料庫映像副本，觀察到在 GCNV NFS 掛載點中已建立資料庫映像副本。

```
RMAN> list copy of database tag 'OraCopyBKUPonGCNV_level_0';

List of Datafile Copies
========================

Key     File S Completion Time Ckp SCN    Ckp Time        Sparse
------- ---- - -------------- ---------- --------------- ------
31      1    A 24-MAY-25       2812886    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-1_1a3q7ii2
        Tag: ORACOPYBKUPONGCNV_LEVEL_0

34      3    A 24-MAY-25       2813001    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-3_1b3q7io5
        Tag: ORACOPYBKUPONGCNV_LEVEL_0

33      4    A 24-MAY-25       2813043    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
```

```
UNDOTBS1_FNO-4_1c3q7ipa
        Tag: ORACOPYBKUPONGCNV_LEVEL_0

42      5    A 24-MAY-25       2377077    21-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-5_1k3q7j5a
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 2, PDB Name: PDB$SEED

37      6    A 24-MAY-25       2377077    21-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-6_1g3q7j0e
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 2, PDB Name: PDB$SEED

47      7    A 24-MAY-25       2813504    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
USERS_FNO-7_1p3q7jbg
        Tag: ORACOPYBKUPONGCNV_LEVEL_0

43      8    A 24-MAY-25       2377077    21-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
UNDOTBS1_FNO-8_1m3q7j82
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 2, PDB Name: PDB$SEED

39      9    A 24-MAY-25       2813238    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-9_1h3q7j35
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

35      10   A 24-MAY-25       2813112    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-10_1d3q7isu
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

44      11   A 24-MAY-25       2813425    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
UNDOTBS1_FNO-11_1l3q7j80
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

48      12   A 24-MAY-25       2813508    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
```

```
USERS_FNO-12_1q3q7jbh
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

40      13   A 24-MAY-25       2813243    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-13_1i3q7j3d
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

36      14   A 24-MAY-25       2813124    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-14_1e3q7itp
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

45      15   A 24-MAY-25       2813463    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
UNDOTBS1_FNO-15_1n3q7j9p
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

49      16   A 24-MAY-25       2813512    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
USERS_FNO-16_1r3q7jbi
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

41      17   A 24-MAY-25       2813364    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-17_1j3q7j56
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

38      18   A 24-MAY-25       2813185    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-18_1f3q7j0e
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

46      19   A 24-MAY-25       2813467    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
UNDOTBS1_FNO-19_1o3q7j9p
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3
```

```
50      20   A 24-MAY-25       2813516    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
USERS_FNO-20_1s3q7jbi
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

6       21   A 23-MAY-25       2768847    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
21_0c3q6gvm
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

7       22   A 23-MAY-25       2768851    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
22_0d3q6gvm
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

12      23   A 23-MAY-25       2777335    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
23_0m3q6qdr
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

24      24   A 24-MAY-25       2803186    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
24_103q78l8
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

5       25   A 23-MAY-25       2768856    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
25_0e3q6gvn
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

15      26   A 23-MAY-25       2777644    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
26_0n3q6qq7
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

25      27   A 24-MAY-25       2803231    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
27_113q78nk
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
```

```
        Container ID: 5, PDB Name: NTAP_PDB3

4       28   A 23-MAY-25       2768859    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
28_0f3q6gvn
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

17      29   A 23-MAY-25       2781833    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
29_0o3q6v5h
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

16      30   A 23-MAY-25       2781842    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
30_0p3q6v6b
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

26      31   A 24-MAY-25       2803450    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
31_123q791p
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

8       32   A 23-MAY-25       2773143    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
32_0g3q6lkl
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

10      33   A 23-MAY-25       2773183    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
33_0h3q6lmf
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

18      34   A 23-MAY-25       2781890    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
34_0q3q6v7o
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

27      35   A 24-MAY-25       2803827    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
```

```
35_133q795m
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

9       36   A 23-MAY-25       2773193    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
36_0i3q6ln9
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

19      37   A 23-MAY-25       2782104    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
37_0r3q6vhu
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

28      38   A 24-MAY-25       2808047    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
38_143q7dd7
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

20      39   A 23-MAY-25       2786009    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
39_0s3q73th
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

29      40   A 24-MAY-25       2808169    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
40_153q7did
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

11      41   A 23-MAY-25       2773323    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
41_0j3q6ltd
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

21      42   A 23-MAY-25       2786042    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
42_0t3q73uv
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2
```

```
30      43   A 24-MAY-25       2808367    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
43_163q7dqp
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

14      44   A 23-MAY-25       2777322    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
44_0k3q6qdc
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

32      45   A 24-MAY-25       2808624    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
45_173q7e17
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

13      46   A 23-MAY-25       2777326    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
46_0l3q6qdc
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

22      47   A 23-MAY-25       2786345    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
47_0u3q747i
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

23      48   A 23-MAY-25       2786456    23-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
48_0v3q74cd
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

52      49   A 24-MAY-25       2812634    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
49_183q7i95
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

51      50   A 24-MAY-25       2812638    24-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
50_193q7i95
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
```

```
        Container ID: 5, PDB Name: NTAP_PDB3

RMAN>
```

9. 從 Oracle RMAN 命令提示字元報告模式以觀察目前 VLDB 資料檔案是否位於主儲存上。

```
RMAN> report schema;

Report of database schema for database with db_unique_name NTAP

List of Permanent Datafiles
===========================
File Size(MB) Tablespace           RB segs Datafile Name
---- -------- -------------------- ------- ------------------------
1    1070     SYSTEM               YES
+DATA/NTAP/DATAFILE/system.257.1201727295
3    970      SYSAUX               NO
+DATA/NTAP/DATAFILE/sysaux.258.1201727339
4    680      UNDOTBS1             YES
+DATA/NTAP/DATAFILE/undotbs1.259.1201727365
5    400      PDB$SEED:SYSTEM      NO
+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/system.266.1201
728307
6    460      PDB$SEED:SYSAUX      NO
+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/sysaux.267.1201
728307
7    5        USERS                NO
+DATA/NTAP/DATAFILE/users.260.1201727365
8    235      PDB$SEED:UNDOTBS1    NO
+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/undotbs1.268.12
01728307
9    410      NTAP_PDB1:SYSTEM     YES
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/system.272.1201
729255
10   510      NTAP_PDB1:SYSAUX     NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/sysaux.273.1201
729255
11   240      NTAP_PDB1:UNDOTBS1   YES
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/undotbs1.271.12
01729255
12   5        NTAP_PDB1:USERS      NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/users.275.12017
29277
13   410      NTAP_PDB2:SYSTEM     YES
```

```
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/system.277.1201
729279
14   510      NTAP_PDB2:SYSAUX     NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/sysaux.278.1201
729279
15   235      NTAP_PDB2:UNDOTBS1   YES
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/undotbs1.276.12
01729279
16   5        NTAP_PDB2:USERS      NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/users.280.12017
29301
17   410      NTAP_PDB3:SYSTEM     YES
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/system.282.1201
729301
18   510      NTAP_PDB3:SYSAUX     NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/sysaux.283.1201
729301
19   235      NTAP_PDB3:UNDOTBS1   YES
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/undotbs1.281.12
01729301
20   5        NTAP_PDB3:USERS      NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/users.285.12017
29323
21   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.286.120179
3019
22   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.287.120179
3419
23   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.288.120179
3535
24   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.289.120179
3665
25   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.290.120179
4401
26   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.291.120179
5153
27   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.292.120179
5207
28   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.293.120179
```

```
5271
29   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.294.120179
6261
30   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.295.120179
7317
31   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.296.120179
7343
32   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.297.120179
7351
33   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.298.120180
0805
34   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.300.120180
0829
35   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.299.120180
0821
36   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.301.120180
1969
37   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.302.120180
2025
38   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.303.120180
2375
39   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.304.120180
3375
40   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.305.120180
3381
41   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.306.120180
3399
42   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.307.120180
4601
43   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.308.120180
4629
```

```
44   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.309.120180
4651
45   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.310.120180
6031
46   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.312.120180
6095
47   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.311.120180
6051
48   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.313.120187
3549
49   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.314.120187
3563
50   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.315.120187
5477

List of Temporary Files
=======================
File Size(MB) Tablespace           Maxsize(MB) Tempfile Name
---- -------- -------------------- ----------- --------------------
1    123      TEMP                 32767
+DATA/NTAP/TEMPFILE/temp.265.1201727469
2    123      PDB$SEED:TEMP        32767
+DATA/NTAP/35AD01790801A78FE063060B460ABC41/TEMPFILE/temp.269.120172
8335
3    16384    NTAP_PDB1:TEMP       32767
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/TEMPFILE/temp.274.120172
9271
4    30720    NTAP_PDB2:TEMP       32767
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/TEMPFILE/temp.279.120172
9295
5    30720    NTAP_PDB3:TEMP       32767
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/TEMPFILE/temp.284.120172
9319

RMAN>
```

10. 驗證來自 OS NFS 掛載點的資料庫映像副本。

```
```

```
[oracle@orap ~]$ ls -l /nfsgcnv/oracopy/
total 954924748
-rw-r----- 1 oracle asm    11600384 May 27 16:25 bct_ntap.ctf
-rw-r----- 1 oracle asm 32212262912 May 23 17:29 data_D-NTAP_I-
1379265854_TS-SOE1_FNO-21_0c3q6gvm
-rw-r----- 1 oracle asm 32212262912 May 23 17:32 data_D-NTAP_I-
1379265854_TS-SOE1_FNO-22_0d3q6gvm
-rw-r----- 1 oracle asm 32212262912 May 23 17:28 data_D-NTAP_I-
1379265854_TS-SOE1_FNO-25_0e3q6gvn
-rw-r----- 1 oracle asm 32212262912 May 23 17:27 data_D-NTAP_I-
1379265854_TS-SOE1_FNO-28_0f3q6gvn
-rw-r----- 1 oracle asm 32212262912 May 23 18:49 data_D-NTAP_I-
1379265854_TS-SOE1_FNO-32_0g3q6lkl
-rw-r----- 1 oracle asm 32212262912 May 23 18:49 data_D-NTAP_I-
1379265854_TS-SOE1_FNO-33_0h3q6lmf
-rw-r----- 1 oracle asm 32212262912 May 23 18:49 data_D-NTAP_I-
1379265854_TS-SOE1_FNO-36_0i3q6ln9
-rw-r----- 1 oracle asm 32212262912 May 23 18:56 data_D-NTAP_I-
1379265854_TS-SOE1_FNO-41_0j3q6ltd
-rw-r----- 1 oracle asm 32212262912 May 23 20:11 data_D-NTAP_I-
1379265854_TS-SOE1_FNO-44_0k3q6qdc
-rw-r----- 1 oracle asm 32212262912 May 23 20:10 data_D-NTAP_I-
1379265854_TS-SOE1_FNO-46_0l3q6qdc
-rw-r----- 1 oracle asm 32212262912 May 23 20:10 data_D-NTAP_I-
1379265854_TS-SOE2_FNO-23_0m3q6qdr
-rw-r----- 1 oracle asm 32212262912 May 23 20:16 data_D-NTAP_I-
1379265854_TS-SOE2_FNO-26_0n3q6qq7
-rw-r----- 1 oracle asm 32212262912 May 23 21:32 data_D-NTAP_I-
1379265854_TS-SOE2_FNO-29_0o3q6v5h
-rw-r----- 1 oracle asm 32212262912 May 23 21:31 data_D-NTAP_I-
1379265854_TS-SOE2_FNO-30_0p3q6v6b
-rw-r----- 1 oracle asm 32212262912 May 23 21:36 data_D-NTAP_I-
1379265854_TS-SOE2_FNO-34_0q3q6v7o
-rw-r----- 1 oracle asm 32212262912 May 23 21:39 data_D-NTAP_I-
1379265854_TS-SOE2_FNO-37_0r3q6vhu
-rw-r----- 1 oracle asm 32212262912 May 23 22:52 data_D-NTAP_I-
1379265854_TS-SOE2_FNO-39_0s3q73th
-rw-r----- 1 oracle asm 32212262912 May 23 22:53 data_D-NTAP_I-
1379265854_TS-SOE2_FNO-42_0t3q73uv
-rw-r----- 1 oracle asm 32212262912 May 23 22:58 data_D-NTAP_I-
1379265854_TS-SOE2_FNO-47_0u3q747i
-rw-r----- 1 oracle asm 32212262912 May 23 23:01 data_D-NTAP_I-
1379265854_TS-SOE2_FNO-48_0v3q74cd
-rw-r----- 1 oracle asm 32212262912 May 24 00:13 data_D-NTAP_I-
1379265854_TS-SOE3_FNO-24_103q78l8
-rw-r----- 1 oracle asm 32212262912 May 24 00:16 data_D-NTAP_I-
```

```
1379265854_TS-SOE3_FNO-27_113q78nk
-rw-r----- 1 oracle asm 32212262912 May 24 00:20 data_D-NTAP_I-
1379265854_TS-SOE3_FNO-31_123q791p
-rw-r----- 1 oracle asm 32212262912 May 24 00:23 data_D-NTAP_I-
1379265854_TS-SOE3_FNO-35_133q795m
-rw-r----- 1 oracle asm 32212262912 May 24 01:36 data_D-NTAP_I-
1379265854_TS-SOE3_FNO-38_143q7dd7
-rw-r----- 1 oracle asm 32212262912 May 24 01:36 data_D-NTAP_I-
1379265854_TS-SOE3_FNO-40_153q7did
-rw-r----- 1 oracle asm 32212262912 May 24 01:41 data_D-NTAP_I-
1379265854_TS-SOE3_FNO-43_163q7dqp
-rw-r----- 1 oracle asm 32212262912 May 24 01:45 data_D-NTAP_I-
1379265854_TS-SOE3_FNO-45_173q7e17
-rw-r----- 1 oracle asm 32212262912 May 24 02:26 data_D-NTAP_I-
1379265854_TS-SOE3_FNO-49_183q7i95
-rw-r----- 1 oracle asm 32212262912 May 24 02:25 data_D-NTAP_I-
1379265854_TS-SOE3_FNO-50_193q7i95
-rw-r----- 1 oracle asm   534781952 May 24 01:48 data_D-NTAP_I-
1379265854_TS-SYSAUX_FNO-10_1d3q7isu
-rw-r----- 1 oracle asm   534781952 May 24 01:49 data_D-NTAP_I-
1379265854_TS-SYSAUX_FNO-14_1e3q7itp
-rw-r----- 1 oracle asm   534781952 May 24 01:50 data_D-NTAP_I-
1379265854_TS-SYSAUX_FNO-18_1f3q7j0e
-rw-r----- 1 oracle asm   985669632 May 24 01:47 data_D-NTAP_I-
1379265854_TS-SYSAUX_FNO-3_1b3q7io5
-rw-r----- 1 oracle asm   482353152 May 24 01:50 data_D-NTAP_I-
1379265854_TS-SYSAUX_FNO-6_1g3q7j0e
-rw-r----- 1 oracle asm  1121984512 May 24 01:44 data_D-NTAP_I-
1379265854_TS-SYSTEM_FNO-1_1a3q7ii2
-rw-r----- 1 oracle asm   429924352 May 24 01:51 data_D-NTAP_I-
1379265854_TS-SYSTEM_FNO-13_1i3q7j3d
-rw-r----- 1 oracle asm   429924352 May 24 01:52 data_D-NTAP_I-
1379265854_TS-SYSTEM_FNO-17_1j3q7j56
-rw-r----- 1 oracle asm   419438592 May 24 01:52 data_D-NTAP_I-
1379265854_TS-SYSTEM_FNO-5_1k3q7j5a
-rw-r----- 1 oracle asm   429924352 May 24 01:51 data_D-NTAP_I-
1379265854_TS-SYSTEM_FNO-9_1h3q7j35
-rw-r----- 1 oracle asm   251666432 May 24 01:53 data_D-NTAP_I-
1379265854_TS-UNDOTBS1_FNO-11_1l3q7j80
-rw-r----- 1 oracle asm   246423552 May 24 01:54 data_D-NTAP_I-
1379265854_TS-UNDOTBS1_FNO-15_1n3q7j9p
-rw-r----- 1 oracle asm   246423552 May 24 01:54 data_D-NTAP_I-
1379265854_TS-UNDOTBS1_FNO-19_1o3q7j9p
-rw-r----- 1 oracle asm   713039872 May 24 01:47 data_D-NTAP_I-
1379265854_TS-UNDOTBS1_FNO-4_1c3q7ipa
-rw-r----- 1 oracle asm   246423552 May 24 01:53 data_D-NTAP_I-
```

```
1379265854_TS-UNDOTBS1_FNO-8_1m3q7j82
-rw-r----- 1 oracle asm     5251072 May 24 01:54 data_D-NTAP_I-
1379265854_TS-USERS_FNO-12_1q3q7jbh
-rw-r----- 1 oracle asm     5251072 May 24 01:54 data_D-NTAP_I-
1379265854_TS-USERS_FNO-16_1r3q7jbi
-rw-r----- 1 oracle asm     5251072 May 24 01:54 data_D-NTAP_I-
1379265854_TS-USERS_FNO-20_1s3q7jbi
-rw-r----- 1 oracle asm     5251072 May 24 01:54 data_D-NTAP_I-
1379265854_TS-USERS_FNO-7_1p3q7jbg
```

11. 依照所需的時間間隔，從 crontab 中的簡單 UNIX shell 腳本執行 RMAN 備份腳本。

```
[oracle@orap ~]$ cat rman_bkup_merge.sh
#/usr/bin/sh

log=/home/oracle/logs/ora_bkup_merge_`date +"%Y-%m%d-%H%M%S"`.log

echo "Begin Oracle DB incremental backup/merge to copy at `date
+"%Y-%m%d-%H%M%S"`" >> $log

export ORACLE_HOME=/u01/app/oracle/product/19.0.0/NTAP
export ORACLE_SID=NTAP
export PATH=$ORACLE_HOME/bin:$PATH

rman target / nocatalog <<EOF>> $log
@/home/oracle/rman_bkup_merge.cmd
EOF

echo "End Oracle DB incremental backup/merge to copy at `date +"%Y-
%m%d-%H%M%S"`" >> $log
```

這完成了從 GCNV 儲存在伺服器內 NFS 掛載上對 Oracle VLDB 備用映像副本備份和合併的設定。

使用備份映像副本快速還原 **Oracle VLDB**

完全恢復遺失或損壞的 **Oracle** 資料文件

如果因主儲存問題（例如資料遺失或損壞）而發生故障，資料庫可以快速切換到 GCNV NFS 掛載上的映像副本，並還原到目前狀態，而無需資料庫還原。消除媒體復原可大幅加快 VLDB 的資料庫復原速度。此用例假設 Oracle VLDB DB 伺服器完好無損，且資料庫控製文件、存檔日誌和目前日誌均可供復原。

1. 以 oracle 使用者身分登入主 VLDB 伺服器主機並在切換之前建立測試表。

```
[oracle@orap ~]$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Tue May 27 17:31:23
2025
Version 19.18.0.0.0

Copyright (c) 1982, 2022, Oracle.  All rights reserved.


Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Version 19.18.0.0.0

SQL> alter session set container=ntap_pdb1;

Session altered.

SQL> create table test(id integer, dt timestamp, event
varchar(100));

Table created.
```

2. 在測試表中插入一行。該行是在最近的增量備份和合併之後插入的，其資料不在備份集中。後續演示將顯示資料庫完全恢復後，測試行也被恢復。

```
SQL> insert into test values (1, sysdate, 'validate a full recovery
after a switch to DB backup copy on GCNV');

1 row created.

SQL> commit;

Commit complete.
```

3. 透過關閉資料庫來模擬故障。

```
SQL> alter session set container=cdb$root;

Session altered.

SQL> shutdown immediate;
Database closed.
Database dismounted.
ORACLE instance shut down.
```

4. 以 oracle 使用者身份，透過 RMAN 連接到 Oracle 資料庫切換要複製的資料庫。

```
[oracle@orap ~]$ rman target / nocatalog;

Recovery Manager: Release 19.0.0.0.0 - Production on Tue May 27
17:40:59 2025
Version 19.18.0.0.0

Copyright (c) 1982, 2019, Oracle and/or its affiliates.  All rights
reserved.

connected to target database (not started)

RMAN> startup mount;

Oracle instance started
database mounted

Total System Global Area    5620363744 bytes

Fixed Size                     9175520 bytes
Variable Size               1023410176 bytes
Database Buffers            4580179968 bytes
Redo Buffers                   7598080 bytes

RMAN> switch database to copy;

datafile 1 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-1_1a3q7ii2"
datafile 3 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-3_1b3q7io5"
datafile 4 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-4_1c3q7ipa"
datafile 5 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-5_1k3q7j5a"
datafile 6 switched to datafile copy "/nfsgcnv/oracopy/data_D-
```

```
NTAP_I-1379265854_TS-SYSAUX_FNO-6_1g3q7j0e"
datafile 7 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-7_1p3q7jbg"
datafile 8 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-8_1m3q7j82"
datafile 9 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-9_1h3q7j35"
datafile 10 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-10_1d3q7isu"
datafile 11 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-11_1l3q7j80"
datafile 12 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-12_1q3q7jbh"
datafile 13 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-13_1i3q7j3d"
datafile 14 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-14_1e3q7itp"
datafile 15 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-15_1n3q7j9p"
datafile 16 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-16_1r3q7jbi"
datafile 17 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-17_1j3q7j56"
datafile 18 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-18_1f3q7j0e"
datafile 19 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-19_1o3q7j9p"
datafile 20 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-20_1s3q7jbi"
datafile 21 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-21_0c3q6gvm"
datafile 22 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-22_0d3q6gvm"
datafile 23 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-23_0m3q6qdr"
datafile 24 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-24_103q78l8"
datafile 25 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-25_0e3q6gvn"
datafile 26 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-26_0n3q6qq7"
datafile 27 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-27_113q78nk"
datafile 28 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-28_0f3q6gvn"
datafile 29 switched to datafile copy "/nfsgcnv/oracopy/data_D-
```

```
NTAP_I-1379265854_TS-SOE2_FNO-29_0o3q6v5h"
datafile 30 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-30_0p3q6v6b"
datafile 31 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-31_123q791p"
datafile 32 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-32_0g3q6lkl"
datafile 33 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-33_0h3q6lmf"
datafile 34 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-34_0q3q6v7o"
datafile 35 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-35_133q795m"
datafile 36 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-36_0i3q6ln9"
datafile 37 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-37_0r3q6vhu"
datafile 38 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-38_143q7dd7"
datafile 39 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-39_0s3q73th"
datafile 40 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-40_153q7did"
datafile 41 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-41_0j3q6ltd"
datafile 42 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-42_0t3q73uv"
datafile 43 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-43_163q7dqp"
datafile 44 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-44_0k3q6qdc"
datafile 45 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-45_173q7e17"
datafile 46 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-46_0l3q6qdc"
datafile 47 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-47_0u3q747i"
datafile 48 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-48_0v3q74cd"
datafile 49 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-49_183q7i95"
datafile 50 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-50_193q7i95"
```

5. 還原並開啟資料庫，使其從上次增量備份更新到目前狀態。

```
RMAN> recover database;

Starting recover at 27-MAY-25
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=139 device type=DISK
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00012: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-12_1q3q7jbh
destination for restore of datafile 00028: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-28_0f3q6gvn
destination for restore of datafile 00041: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-41_0j3q6ltd
destination for restore of datafile 00044: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-44_0k3q6qdc
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/213qh3m5_65_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/213qh3m5_65_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00011: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-11_1l3q7j80
destination for restore of datafile 00025: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-25_0e3q6gvn
destination for restore of datafile 00036: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-36_0i3q6ln9
destination for restore of datafile 00046: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-46_0l3q6qdc
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/1u3qh3m5_62_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/1u3qh3m5_62_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00015: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-15_1n3q7j9p
destination for restore of datafile 00029: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-29_0o3q6v5h
```

```
destination for restore of datafile 00039: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-39_0s3q73th
destination for restore of datafile 00048: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-48_0v3q74cd
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/1v3qh3m5_63_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/1v3qh3m5_63_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00019: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-19_1o3q7j9p
destination for restore of datafile 00031: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-31_123q791p
destination for restore of datafile 00043: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-43_163q7dqp
destination for restore of datafile 00050: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-50_193q7i95
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/203qh3m5_64_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/203qh3m5_64_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00010: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-10_1d3q7isu
destination for restore of datafile 00021: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-21_0c3q6gvm
destination for restore of datafile 00032: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-32_0g3q6lkl
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/243qh3m7_68_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/243qh3m7_68_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00016: /nfsgcnv/oracopy/data_D-
```

```
NTAP_I-1379265854_TS-USERS_FNO-16_1r3q7jbi
destination for restore of datafile 00030: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-30_0p3q6v6b
destination for restore of datafile 00042: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-42_0t3q73uv
destination for restore of datafile 00047: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-47_0u3q747i
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/223qh3m6_66_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/223qh3m6_66_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00020: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-20_1s3q7jbi
destination for restore of datafile 00035: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-35_133q795m
destination for restore of datafile 00045: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-45_173q7e17
destination for restore of datafile 00049: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-49_183q7i95
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/233qh3m7_67_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/233qh3m7_67_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00009: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-9_1h3q7j35
destination for restore of datafile 00022: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-22_0d3q6gvm
destination for restore of datafile 00033: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-33_0h3q6lmf
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/273qh3m7_71_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/273qh3m7_71_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
```

```
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00013: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-13_1i3q7j3d
destination for restore of datafile 00026: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-26_0n3q6qq7
destination for restore of datafile 00037: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-37_0r3q6vhu
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/283qh3m7_72_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/283qh3m7_72_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00014: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-14_1e3q7itp
destination for restore of datafile 00023: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-23_0m3q6qdr
destination for restore of datafile 00034: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-34_0q3q6v7o
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/253qh3m7_69_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/253qh3m7_69_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00018: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-18_1f3q7j0e
destination for restore of datafile 00024: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-24_103q78l8
destination for restore of datafile 00038: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-38_143q7dd7
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/263qh3m7_70_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/263qh3m7_70_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:02
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
```

```
set
destination for restore of datafile 00001: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-1_1a3q7ii2
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/2a3qh3m9_74_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/2a3qh3m9_74_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00017: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-17_1j3q7j56
destination for restore of datafile 00027: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-27_113q78nk
destination for restore of datafile 00040: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-40_153q7did
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/293qh3m9_73_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/293qh3m9_73_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00007: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-7_1p3q7jbg
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/2g3qh3ma_80_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/2g3qh3ma_80_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00004: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-4_1c3q7ipa
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/2c3qh3m9_76_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/2c3qh3m9_76_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:03
```

```
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00003: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-3_1b3q7io5
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/2b3qh3m9_75_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/2b3qh3m9_75_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:07

starting media recovery
media recovery complete, elapsed time: 00:00:04

Finished recover at 27-MAY-25

RMAN> alter database open;

Statement processed

RMAN>
```

6. 復原後從 sqlplus 檢查資料庫結構，觀察到除控制、臨時和目前日誌檔案之外的所有 VLDB 資料檔案現在都已切換到 GCNV NFS 檔案系統上的副本。

```
[oracle@orap ~]$ sqlplus / as sysdba;

SQL*Plus: Release 19.0.0.0.0 - Production on Tue May 27 17:45:04
2025
Version 19.18.0.0.0

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Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Version 19.18.0.0.0

SQL> show pdbs;

    CON_ID CON_NAME                       OPEN MODE  RESTRICTED
---------- ------------------------------ ---------- ----------
         2 PDB$SEED                       READ ONLY  NO
         3 NTAP_PDB1                      READ WRITE NO
```

```
         4 NTAP_PDB2                      READ WRITE NO
         5 NTAP_PDB3                      READ WRITE NO
SQL> select name from v$datafile
  2  union
  3  select name from v$tempfile
  4  union
  5  select name from v$controlfile
  6  union
  7  select member from v$logfile;

NAME
--------------------------------------------------------------------------------
------------
+DATA/NTAP/35AD01790801A78FE063060B460ABC41/TEMPFILE/temp.269.120172
8335
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/TEMPFILE/temp.274.120172
9271
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/TEMPFILE/temp.279.120172
9295
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/TEMPFILE/temp.284.120172
9319
+DATA/NTAP/CONTROLFILE/current.261.1201727423
+DATA/NTAP/ONLINELOG/group_1.262.1201727425
+DATA/NTAP/ONLINELOG/group_2.263.1201727425
+DATA/NTAP/ONLINELOG/group_3.264.1201727425
+DATA/NTAP/TEMPFILE/temp.265.1201727469
+LOGS/NTAP/CONTROLFILE/current.256.1201727423
+LOGS/NTAP/ONLINELOG/group_1.258.1201727433

NAME
--------------------------------------------------------------------------------
------------
+LOGS/NTAP/ONLINELOG/group_2.257.1201727431
+LOGS/NTAP/ONLINELOG/group_3.259.1201727433
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-21_0c3q6gvm
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-22_0d3q6gvm
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-25_0e3q6gvn
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-28_0f3q6gvn
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-32_0g3q6lkl
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-33_0h3q6lmf
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-36_0i3q6ln9
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-41_0j3q6ltd
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-44_0k3q6qdc

NAME
--------------------------------------------------------------------------------
```

```
------------
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-46_0l3q6qdc
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-23_0m3q6qdr
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-26_0n3q6qq7
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-29_0o3q6v5h
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-30_0p3q6v6b
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-34_0q3q6v7o
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-37_0r3q6vhu
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-39_0s3q73th
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-42_0t3q73uv
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-47_0u3q747i
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-48_0v3q74cd

NAME
--------------------------------------------------------------------
------------
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-24_103q78l8
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-27_113q78nk
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-31_123q791p
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-35_133q795m
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-38_143q7dd7
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-40_153q7did
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-43_163q7dqp
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-45_173q7e17
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-49_183q7i95
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-50_193q7i95
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSAUX_FNO-10_1d3q7isu

NAME
--------------------------------------------------------------------
------------
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSAUX_FNO-14_1e3q7itp
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSAUX_FNO-18_1f3q7j0e
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSAUX_FNO-3_1b3q7io5
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSAUX_FNO-6_1g3q7j0e
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSTEM_FNO-13_1i3q7j3d
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSTEM_FNO-17_1j3q7j56
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSTEM_FNO-1_1a3q7ii2
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSTEM_FNO-5_1k3q7j5a
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSTEM_FNO-9_1h3q7j35
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-UNDOTBS1_FNO-
11_1l3q7j80
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-UNDOTBS1_FNO-
15_1n3q7j9p

NAME
```

```
------------------------------------------------------------------------
------------
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-UNDOTBS1_FNO-
19_1o3q7j9p
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-UNDOTBS1_FNO-4_1c3q7ipa
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-UNDOTBS1_FNO-8_1m3q7j82
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-USERS_FNO-12_1q3q7jbh
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-USERS_FNO-16_1r3q7jbi
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-USERS_FNO-20_1s3q7jbi
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-USERS_FNO-7_1p3q7jbg

62 rows selected.
```

7. 從 SQL plus 中，驗證上次增量備份之後和切換到映像備份副本之前我們已惰性化的測試行是否已還原。

```
SQL> alter session set container=ntap_pdb1;

Session altered.

SQL> select * from test;

        ID
----------
DT
------------------------------------------------------------------------
-------
EVENT
------------------------------------------------------------------------
------------
         1
27-MAY-25 05.35.44.000000 PM
validate a full recovery after a switch to DB backup copy on GCNV


SQL>
```

將 **Oracle VLDB** 從備份副本還原到主存儲

主存儲的存儲故障修復後，資料庫可以輕鬆恢復到主存儲，並且停機時間最短。以下是逐步操作步驟。

1. 從 RMAN 檢查 DB 模式目前位於 GCNV 備份儲存上。

```
RMAN> report schema;

Report of database schema for database with db_unique_name NTAP

List of Permanent Datafiles
===========================
File Size(MB) Tablespace           RB segs Datafile Name
---- -------- -------------------- ------- ------------------------
1    1070     SYSTEM               YES     /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-1_1a3q7ii2
3    970      SYSAUX               NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-3_1b3q7io5
4    680      UNDOTBS1             YES     /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-4_1c3q7ipa
5    400      PDB$SEED:SYSTEM      NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-5_1k3q7j5a
6    460      PDB$SEED:SYSAUX      NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-6_1g3q7j0e
7    5        USERS                NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-7_1p3q7jbg
8    235      PDB$SEED:UNDOTBS1    NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-8_1m3q7j82
9    410      NTAP_PDB1:SYSTEM     YES     /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-9_1h3q7j35
10   510      NTAP_PDB1:SYSAUX     NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-10_1d3q7isu
11   240      NTAP_PDB1:UNDOTBS1   YES     /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-11_1l3q7j80
12   5        NTAP_PDB1:USERS      NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-12_1q3q7jbh
13   410      NTAP_PDB2:SYSTEM     YES     /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-13_1i3q7j3d
14   510      NTAP_PDB2:SYSAUX     NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-14_1e3q7itp
15   235      NTAP_PDB2:UNDOTBS1   YES     /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-15_1n3q7j9p
16   5        NTAP_PDB2:USERS      NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-16_1r3q7jbi
17   410      NTAP_PDB3:SYSTEM     YES     /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-17_1j3q7j56
18   510      NTAP_PDB3:SYSAUX     NO      /nfsgcnv/oracopy/data_D-
```

```
NTAP_I-1379265854_TS-SYSAUX_FNO-18_1f3q7j0e
19   235      NTAP_PDB3:UNDOTBS1   YES     /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-19_1o3q7j9p
20   5        NTAP_PDB3:USERS      NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-20_1s3q7jbi
21   30720    NTAP_PDB1:SOE1       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-21_0c3q6gvm
22   30720    NTAP_PDB1:SOE1       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-22_0d3q6gvm
23   30720    NTAP_PDB2:SOE2       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-23_0m3q6qdr
24   30720    NTAP_PDB3:SOE3       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-24_103q78l8
25   30720    NTAP_PDB1:SOE1       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-25_0e3q6gvn
26   30720    NTAP_PDB2:SOE2       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-26_0n3q6qq7
27   30720    NTAP_PDB3:SOE3       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-27_113q78nk
28   30720    NTAP_PDB1:SOE1       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-28_0f3q6gvn
29   30720    NTAP_PDB2:SOE2       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-29_0o3q6v5h
30   30720    NTAP_PDB2:SOE2       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-30_0p3q6v6b
31   30720    NTAP_PDB3:SOE3       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-31_123q791p
32   30720    NTAP_PDB1:SOE1       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-32_0g3q6lkl
33   30720    NTAP_PDB1:SOE1       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-33_0h3q6lmf
34   30720    NTAP_PDB2:SOE2       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-34_0q3q6v7o
35   30720    NTAP_PDB3:SOE3       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-35_133q795m
36   30720    NTAP_PDB1:SOE1       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-36_0i3q6ln9
37   30720    NTAP_PDB2:SOE2       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-37_0r3q6vhu
38   30720    NTAP_PDB3:SOE3       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-38_143q7dd7
39   30720    NTAP_PDB2:SOE2       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-39_0s3q73th
40   30720    NTAP_PDB3:SOE3       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-40_153q7did
41   30720    NTAP_PDB1:SOE1       NO      /nfsgcnv/oracopy/data_D-
```

```
NTAP_I-1379265854_TS-SOE1_FNO-41_0j3q6ltd
42   30720    NTAP_PDB2:SOE2       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-42_0t3q73uv
43   30720    NTAP_PDB3:SOE3       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-43_163q7dqp
44   30720    NTAP_PDB1:SOE1       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-44_0k3q6qdc
45   30720    NTAP_PDB3:SOE3       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-45_173q7e17
46   30720    NTAP_PDB1:SOE1       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-46_0l3q6qdc
47   30720    NTAP_PDB2:SOE2       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-47_0u3q747i
48   30720    NTAP_PDB2:SOE2       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-48_0v3q74cd
49   30720    NTAP_PDB3:SOE3       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-49_183q7i95
50   30720    NTAP_PDB3:SOE3       NO      /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-50_193q7i95

List of Temporary Files
=======================
File Size(MB) Tablespace           Maxsize(MB) Tempfile Name
---- -------- -------------------- ----------- --------------------
1    123      TEMP                 32767
+DATA/NTAP/TEMPFILE/temp.265.1201727469
2    123      PDB$SEED:TEMP        32767
+DATA/NTAP/35AD01790801A78FE063060B460ABC41/TEMPFILE/temp.269.120172
8335
3    16384    NTAP_PDB1:TEMP       32767
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/TEMPFILE/temp.274.120172
9271
4    30720    NTAP_PDB2:TEMP       32767
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/TEMPFILE/temp.279.120172
9295
5    30720    NTAP_PDB3:TEMP       32767
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/TEMPFILE/temp.284.120172
9319
```

2. 一旦主資料庫切換到映像副本，主資料庫現在就是 RMAN 記錄中的副本。

```
RMAN> list copy of database;

List of Datafile Copies
=======================
```

```
Key     File S Completion Time Ckp SCN    Ckp Time        Sparse
------- ---- - -------------- ---------- --------------- ------
53      1    A 27-MAY-25       2901679    27-MAY-25       NO
        Name: +DATA/NTAP/DATAFILE/system.257.1201727295

54      3    A 27-MAY-25       2901679    27-MAY-25       NO
        Name: +DATA/NTAP/DATAFILE/sysaux.258.1201727339

55      4    A 27-MAY-25       2901679    27-MAY-25       NO
        Name: +DATA/NTAP/DATAFILE/undotbs1.259.1201727365

56      5    A 27-MAY-25       2377077    21-MAY-25       NO
        Name:
+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/system.266.1201
728307
        Container ID: 2, PDB Name: PDB$SEED

57      6    A 27-MAY-25       2377077    21-MAY-25       NO
        Name:
+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/sysaux.267.1201
728307
        Container ID: 2, PDB Name: PDB$SEED

58      7    A 27-MAY-25       2901679    27-MAY-25       NO
        Name: +DATA/NTAP/DATAFILE/users.260.1201727365

59      8    A 27-MAY-25       2377077    21-MAY-25       NO
        Name:
+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/undotbs1.268.12
01728307
        Container ID: 2, PDB Name: PDB$SEED

60      9    A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/system.272.1201
729255
        Container ID: 3, PDB Name: NTAP_PDB1

61      10   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/sysaux.273.1201
729255
        Container ID: 3, PDB Name: NTAP_PDB1

62      11   A 27-MAY-25       2901354    27-MAY-25       NO
```

```
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/undotbs1.271.12
01729255
        Container ID: 3, PDB Name: NTAP_PDB1

63      12   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/users.275.12017
29277
        Container ID: 3, PDB Name: NTAP_PDB1

64      13   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/system.277.1201
729279
        Container ID: 4, PDB Name: NTAP_PDB2

65      14   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/sysaux.278.1201
729279
        Container ID: 4, PDB Name: NTAP_PDB2

66      15   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/undotbs1.276.12
01729279
        Container ID: 4, PDB Name: NTAP_PDB2

67      16   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/users.280.12017
29301
        Container ID: 4, PDB Name: NTAP_PDB2

68      17   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/system.282.1201
729301
        Container ID: 5, PDB Name: NTAP_PDB3

69      18   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/sysaux.283.1201
729301
        Container ID: 5, PDB Name: NTAP_PDB3
```

```
70      19   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/undotbs1.281.12
01729301
        Container ID: 5, PDB Name: NTAP_PDB3

71      20   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/users.285.12017
29323
        Container ID: 5, PDB Name: NTAP_PDB3

72      21   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.286.120179
3019
        Container ID: 3, PDB Name: NTAP_PDB1

73      22   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.287.120179
3419
        Container ID: 3, PDB Name: NTAP_PDB1

74      23   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.288.120179
3535
        Container ID: 4, PDB Name: NTAP_PDB2

75      24   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.289.120179
3665
        Container ID: 5, PDB Name: NTAP_PDB3

76      25   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.290.120179
4401
        Container ID: 3, PDB Name: NTAP_PDB1

77      26   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.291.120179
5153
```

```
        Container ID: 4, PDB Name: NTAP_PDB2

78      27   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.292.120179
5207
        Container ID: 5, PDB Name: NTAP_PDB3

79      28   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.293.120179
5271
        Container ID: 3, PDB Name: NTAP_PDB1

80      29   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.294.120179
6261
        Container ID: 4, PDB Name: NTAP_PDB2

81      30   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.295.120179
7317
        Container ID: 4, PDB Name: NTAP_PDB2

82      31   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.296.120179
7343
        Container ID: 5, PDB Name: NTAP_PDB3

83      32   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.297.120179
7351
        Container ID: 3, PDB Name: NTAP_PDB1

84      33   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.298.120180
0805
        Container ID: 3, PDB Name: NTAP_PDB1

85      34   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
```

```
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.300.120180
0829
        Container ID: 4, PDB Name: NTAP_PDB2

86      35   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.299.120180
0821
        Container ID: 5, PDB Name: NTAP_PDB3

87      36   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.301.120180
1969
        Container ID: 3, PDB Name: NTAP_PDB1

88      37   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.302.120180
2025
        Container ID: 4, PDB Name: NTAP_PDB2

89      38   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.303.120180
2375
        Container ID: 5, PDB Name: NTAP_PDB3

90      39   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.304.120180
3375
        Container ID: 4, PDB Name: NTAP_PDB2

91      40   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.305.120180
3381
        Container ID: 5, PDB Name: NTAP_PDB3

92      41   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.306.120180
3399
        Container ID: 3, PDB Name: NTAP_PDB1
```

```
93      42   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.307.120180
4601
        Container ID: 4, PDB Name: NTAP_PDB2

94      43   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.308.120180
4629
        Container ID: 5, PDB Name: NTAP_PDB3

95      44   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.309.120180
4651
        Container ID: 3, PDB Name: NTAP_PDB1

96      45   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.310.120180
6031
        Container ID: 5, PDB Name: NTAP_PDB3

97      46   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.312.120180
6095
        Container ID: 3, PDB Name: NTAP_PDB1

98      47   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.311.120180
6051
        Container ID: 4, PDB Name: NTAP_PDB2

99      48   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.313.120187
3549
        Container ID: 4, PDB Name: NTAP_PDB2

100     49   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.314.120187
3563
```

```
        Container ID: 5, PDB Name: NTAP_PDB3

101     50   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.315.120187
5477
        Container ID: 5, PDB Name: NTAP_PDB3
```

3. 如果存在，請清除主儲存上現已過時的資料文件，以釋放空間和/或清除記錄。

```
RMAN> delete copy of database;

allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=137 device type=DISK
List of Datafile Copies
=======================

Key     File S Completion Time Ckp SCN    Ckp Time        Sparse
------- ---- - --------------- ---------- --------------- ------
53      1    A 27-MAY-25       2901679    27-MAY-25       NO
        Name: +DATA/NTAP/DATAFILE/system.257.1201727295

54      3    A 27-MAY-25       2901679    27-MAY-25       NO
        Name: +DATA/NTAP/DATAFILE/sysaux.258.1201727339

55      4    A 27-MAY-25       2901679    27-MAY-25       NO
        Name: +DATA/NTAP/DATAFILE/undotbs1.259.1201727365

56      5    A 27-MAY-25       2377077    21-MAY-25       NO
        Name:
+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/system.266.1201
728307
        Container ID: 2, PDB Name: PDB$SEED

57      6    A 27-MAY-25       2377077    21-MAY-25       NO
        Name:
+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/sysaux.267.1201
728307
        Container ID: 2, PDB Name: PDB$SEED

58      7    A 27-MAY-25       2901679    27-MAY-25       NO
        Name: +DATA/NTAP/DATAFILE/users.260.1201727365

59      8    A 27-MAY-25       2377077    21-MAY-25       NO
        Name:
```

```
+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/undotbs1.268.12
01728307
        Container ID: 2, PDB Name: PDB$SEED

60      9    A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/system.272.1201
729255
        Container ID: 3, PDB Name: NTAP_PDB1

61      10   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/sysaux.273.1201
729255
        Container ID: 3, PDB Name: NTAP_PDB1

62      11   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/undotbs1.271.12
01729255
        Container ID: 3, PDB Name: NTAP_PDB1

63      12   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/users.275.12017
29277
        Container ID: 3, PDB Name: NTAP_PDB1

64      13   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/system.277.1201
729279
        Container ID: 4, PDB Name: NTAP_PDB2

65      14   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/sysaux.278.1201
729279
        Container ID: 4, PDB Name: NTAP_PDB2

66      15   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/undotbs1.276.12
01729279
        Container ID: 4, PDB Name: NTAP_PDB2
```

```
67      16   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/users.280.12017
29301
        Container ID: 4, PDB Name: NTAP_PDB2

68      17   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/system.282.1201
729301
        Container ID: 5, PDB Name: NTAP_PDB3

69      18   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/sysaux.283.1201
729301
        Container ID: 5, PDB Name: NTAP_PDB3

70      19   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/undotbs1.281.12
01729301
        Container ID: 5, PDB Name: NTAP_PDB3

71      20   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/users.285.12017
29323
        Container ID: 5, PDB Name: NTAP_PDB3

72      21   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.286.120179
3019
        Container ID: 3, PDB Name: NTAP_PDB1

73      22   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.287.120179
3419
        Container ID: 3, PDB Name: NTAP_PDB1

74      23   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.288.120179
3535
```

```
        Container ID: 4, PDB Name: NTAP_PDB2

75      24   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.289.120179
3665
        Container ID: 5, PDB Name: NTAP_PDB3

76      25   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.290.120179
4401
        Container ID: 3, PDB Name: NTAP_PDB1

77      26   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.291.120179
5153
        Container ID: 4, PDB Name: NTAP_PDB2

78      27   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.292.120179
5207
        Container ID: 5, PDB Name: NTAP_PDB3

79      28   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.293.120179
5271
        Container ID: 3, PDB Name: NTAP_PDB1

80      29   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.294.120179
6261
        Container ID: 4, PDB Name: NTAP_PDB2

81      30   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.295.120179
7317
        Container ID: 4, PDB Name: NTAP_PDB2

82      31   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
```

```
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.296.120179
7343
        Container ID: 5, PDB Name: NTAP_PDB3

83      32   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.297.120179
7351
        Container ID: 3, PDB Name: NTAP_PDB1

84      33   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.298.120180
0805
        Container ID: 3, PDB Name: NTAP_PDB1

85      34   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.300.120180
0829
        Container ID: 4, PDB Name: NTAP_PDB2

86      35   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.299.120180
0821
        Container ID: 5, PDB Name: NTAP_PDB3

87      36   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.301.120180
1969
        Container ID: 3, PDB Name: NTAP_PDB1

88      37   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.302.120180
2025
        Container ID: 4, PDB Name: NTAP_PDB2

89      38   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.303.120180
2375
        Container ID: 5, PDB Name: NTAP_PDB3
```

```
90      39   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.304.120180
3375
        Container ID: 4, PDB Name: NTAP_PDB2

91      40   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.305.120180
3381
        Container ID: 5, PDB Name: NTAP_PDB3

92      41   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.306.120180
3399
        Container ID: 3, PDB Name: NTAP_PDB1

93      42   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.307.120180
4601
        Container ID: 4, PDB Name: NTAP_PDB2

94      43   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.308.120180
4629
        Container ID: 5, PDB Name: NTAP_PDB3

95      44   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.309.120180
4651
        Container ID: 3, PDB Name: NTAP_PDB1

96      45   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.310.120180
6031
        Container ID: 5, PDB Name: NTAP_PDB3

97      46   A 27-MAY-25       2901354    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.312.120180
6095
```

```
        Container ID: 3, PDB Name: NTAP_PDB1

98      47   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.311.120180
6051
        Container ID: 4, PDB Name: NTAP_PDB2

99      48   A 27-MAY-25       2901510    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.313.120187
3549
        Container ID: 4, PDB Name: NTAP_PDB2

100     49   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.314.120187
3563
        Container ID: 5, PDB Name: NTAP_PDB3

101     50   A 27-MAY-25       2901509    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.315.120187
5477
        Container ID: 5, PDB Name: NTAP_PDB3


Do you really want to delete the above objects (enter YES or NO)?
YES
deleted datafile copy
datafile copy file name=+DATA/NTAP/DATAFILE/system.257.1201727295
RECID=53 STAMP=1202233336
deleted datafile copy
datafile copy file name=+DATA/NTAP/DATAFILE/sysaux.258.1201727339
RECID=54 STAMP=1202233336
deleted datafile copy
datafile copy file name=+DATA/NTAP/DATAFILE/undotbs1.259.1201727365
RECID=55 STAMP=1202233336
deleted datafile copy
datafile copy file
name=+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/system.266
.1201728307 RECID=56 STAMP=1202233336
deleted datafile copy
datafile copy file
name=+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/sysaux.267
.1201728307 RECID=57 STAMP=1202233336
```

```
deleted datafile copy
datafile copy file name=+DATA/NTAP/DATAFILE/users.260.1201727365
RECID=58 STAMP=1202233336
deleted datafile copy
datafile copy file
name=+DATA/NTAP/86B637B62FE07A65E053F706E80A27CA/DATAFILE/undotbs1.2
68.1201728307 RECID=59 STAMP=1202233336
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/system.272
.1201729255 RECID=60 STAMP=1202233336
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/sysaux.273
.1201729255 RECID=61 STAMP=1202233336
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/undotbs1.2
71.1201729255 RECID=62 STAMP=1202233336
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/users.275.
1201729277 RECID=63 STAMP=1202233336
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/system.277
.1201729279 RECID=64 STAMP=1202233336
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/sysaux.278
.1201729279 RECID=65 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/undotbs1.2
76.1201729279 RECID=66 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/users.280.
1201729301 RECID=67 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/system.282
.1201729301 RECID=68 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/sysaux.283
```

```
.1201729301 RECID=69 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/undotbs1.2
81.1201729301 RECID=70 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/users.285.
1201729323 RECID=71 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.286.1
201793019 RECID=72 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.287.1
201793419 RECID=73 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.288.1
201793535 RECID=74 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.289.1
201793665 RECID=75 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.290.1
201794401 RECID=76 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.291.1
201795153 RECID=77 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.292.1
201795207 RECID=78 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.293.1
201795271 RECID=79 STAMP=1202233337
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.294.1
201796261 RECID=80 STAMP=1202233337
deleted datafile copy
```

```
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.295.1
201797317 RECID=81 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.296.1
201797343 RECID=82 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.297.1
201797351 RECID=83 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.298.1
201800805 RECID=84 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.300.1
201800829 RECID=85 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.299.1
201800821 RECID=86 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.301.1
201801969 RECID=87 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.302.1
201802025 RECID=88 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.303.1
201802375 RECID=89 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.304.1
201803375 RECID=90 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.305.1
201803381 RECID=91 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.306.1
```

```
201803399 RECID=92 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.307.1
201804601 RECID=93 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.308.1
201804629 RECID=94 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.309.1
201804651 RECID=95 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.310.1
201806031 RECID=96 STAMP=1202233338
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.312.1
201806095 RECID=97 STAMP=1202233339
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.311.1
201806051 RECID=98 STAMP=1202233339
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.313.1
201873549 RECID=99 STAMP=1202233339
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.314.1
201873563 RECID=100 STAMP=1202233339
deleted datafile copy
datafile copy file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.315.1
201875477 RECID=101 STAMP=1202233339
Deleted 49 objects


RMAN> list copy of database;

specification does not match any datafile copy in the repository
```

4. 修改 rman 備份和合併腳本以指向主存儲，在我們的測試案例中 - RMAN 通道定義中的 ASM 磁碟組 +DATA。執行修改後的備份腳本以在主儲存體上建立新的映像副本。

```
RMAN> @/home/oracle/rman_bkup_merge.cmd.1

RMAN> RUN
2> {
3>   allocate channel c1 device type disk format '+DATA';
4>   allocate channel c2 device type disk format '+DATA';
5>   allocate channel c3 device type disk format '+DATA';
6>   allocate channel c4 device type disk format '+DATA';
7>   delete obsolete;
8>   sql 'alter system archive log current';
9>   recover copy of database with tag 'OraCopyBKUPonGCNV_level_0';
10>   backup incremental level 1 copies=1 for recover of copy with
tag 'OraCopyBKUPonGCNV_level_0' database;
11> }
released channel: ORA_DISK_1
allocated channel: c1
channel c1: SID=137 device type=DISK

allocated channel: c2
channel c2: SID=397 device type=DISK

allocated channel: c3
channel c3: SID=390 device type=DISK

allocated channel: c4
channel c4: SID=274 device type=DISK

RMAN retention policy will be applied to the command
RMAN retention policy is set to redundancy 1
Deleting the following obsolete backups and copies:
Type                 Key    Completion Time    Filename/Handle
-------------------- ------ ------------------ --------------------
Backup Set           12     24-MAY-25
  Backup Piece       12     24-MAY-25
/nfsgcnv/archlog/NTAP/autobackup/2025_05_24/o1_mf_s_1201919173_n32cl
775_.bkp
deleted backup piece
backup piece
handle=/nfsgcnv/archlog/NTAP/autobackup/2025_05_24/o1_mf_s_120191917
3_n32cl775_.bkp RECID=12 STAMP=1201919175
Deleted 1 objects


sql statement: alter system archive log current

Starting recover at 27-MAY-25
```

```
no copy of datafile 1 found to recover
no copy of datafile 3 found to recover
no copy of datafile 4 found to recover
no copy of datafile 5 found to recover
no copy of datafile 6 found to recover
no copy of datafile 7 found to recover
no copy of datafile 8 found to recover
no copy of datafile 9 found to recover
no copy of datafile 10 found to recover
no copy of datafile 11 found to recover
no copy of datafile 12 found to recover
no copy of datafile 13 found to recover
no copy of datafile 14 found to recover
no copy of datafile 15 found to recover
no copy of datafile 16 found to recover
no copy of datafile 17 found to recover
no copy of datafile 18 found to recover
no copy of datafile 19 found to recover
no copy of datafile 20 found to recover
no copy of datafile 21 found to recover
no copy of datafile 22 found to recover
no copy of datafile 23 found to recover
no copy of datafile 24 found to recover
no copy of datafile 25 found to recover
no copy of datafile 26 found to recover
no copy of datafile 27 found to recover
no copy of datafile 28 found to recover
no copy of datafile 29 found to recover
no copy of datafile 30 found to recover
no copy of datafile 31 found to recover
no copy of datafile 32 found to recover
no copy of datafile 33 found to recover
no copy of datafile 34 found to recover
no copy of datafile 35 found to recover
no copy of datafile 36 found to recover
no copy of datafile 37 found to recover
no copy of datafile 38 found to recover
no copy of datafile 39 found to recover
no copy of datafile 40 found to recover
no copy of datafile 41 found to recover
no copy of datafile 42 found to recover
no copy of datafile 43 found to recover
no copy of datafile 44 found to recover
no copy of datafile 45 found to recover
no copy of datafile 46 found to recover
no copy of datafile 47 found to recover
```

```
no copy of datafile 48 found to recover
no copy of datafile 49 found to recover
no copy of datafile 50 found to recover
Finished recover at 27-MAY-25

Starting backup at 27-MAY-25
no parent backup or copy of datafile 1 found
no parent backup or copy of datafile 3 found
no parent backup or copy of datafile 4 found
no parent backup or copy of datafile 7 found
no parent backup or copy of datafile 6 found
no parent backup or copy of datafile 5 found
no parent backup or copy of datafile 8 found
no parent backup or copy of datafile 21 found
no parent backup or copy of datafile 22 found
no parent backup or copy of datafile 25 found
no parent backup or copy of datafile 28 found
no parent backup or copy of datafile 32 found
no parent backup or copy of datafile 33 found
no parent backup or copy of datafile 36 found
no parent backup or copy of datafile 41 found
no parent backup or copy of datafile 44 found
no parent backup or copy of datafile 46 found
no parent backup or copy of datafile 10 found
no parent backup or copy of datafile 9 found
no parent backup or copy of datafile 11 found
no parent backup or copy of datafile 12 found
no parent backup or copy of datafile 23 found
no parent backup or copy of datafile 26 found
no parent backup or copy of datafile 29 found
no parent backup or copy of datafile 30 found
no parent backup or copy of datafile 34 found
no parent backup or copy of datafile 37 found
no parent backup or copy of datafile 39 found
no parent backup or copy of datafile 42 found
no parent backup or copy of datafile 47 found
no parent backup or copy of datafile 48 found
no parent backup or copy of datafile 14 found
no parent backup or copy of datafile 13 found
no parent backup or copy of datafile 15 found
no parent backup or copy of datafile 16 found
no parent backup or copy of datafile 24 found
no parent backup or copy of datafile 27 found
no parent backup or copy of datafile 31 found
no parent backup or copy of datafile 35 found
no parent backup or copy of datafile 38 found
```

```
no parent backup or copy of datafile 40 found
no parent backup or copy of datafile 43 found
no parent backup or copy of datafile 45 found
no parent backup or copy of datafile 49 found
no parent backup or copy of datafile 50 found
no parent backup or copy of datafile 18 found
no parent backup or copy of datafile 17 found
no parent backup or copy of datafile 19 found
no parent backup or copy of datafile 20 found
channel c1: starting datafile copy
input datafile file number=00021 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-21_0c3q6gvm
channel c2: starting datafile copy
input datafile file number=00022 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-22_0d3q6gvm
channel c3: starting datafile copy
input datafile file number=00025 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-25_0e3q6gvn
channel c4: starting datafile copy
input datafile file number=00028 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-28_0f3q6gvn
output file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.313.1
202239779 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=148 STAMP=1202243608
channel c2: datafile copy complete, elapsed time: 01:03:56
channel c2: starting datafile copy
input datafile file number=00032 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-32_0g3q6lkl
output file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.311.1
202239779 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=149 STAMP=1202243617
channel c3: datafile copy complete, elapsed time: 01:03:60
channel c3: starting datafile copy
input datafile file number=00033 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-33_0h3q6lmf
output file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.315.1
202239779 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=150 STAMP=1202243621
channel c1: datafile copy complete, elapsed time: 01:04:03
channel c1: starting datafile copy
input datafile file number=00036 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-36_0i3q6ln9
output file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.314.1
202239779 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=151 STAMP=1202243625
channel c4: datafile copy complete, elapsed time: 01:04:11
```

```
channel c4: starting datafile copy
input datafile file number=00041 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-41_0j3q6ltd
output file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.312.1
202243617 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=153 STAMP=1202247449
channel c2: datafile copy complete, elapsed time: 01:03:60
channel c2: starting datafile copy
input datafile file number=00044 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-44_0k3q6qdc
output file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.310.1
202243619 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=152 STAMP=1202247446
channel c3: datafile copy complete, elapsed time: 01:03:57
channel c3: starting datafile copy
input datafile file number=00046 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-46_0l3q6qdc
output file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.308.1
202243631 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=154 STAMP=1202247463
channel c4: datafile copy complete, elapsed time: 01:04:02
channel c4: starting datafile copy
input datafile file number=00023 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-23_0m3q6qdr
output file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.309.1
202243625 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=155 STAMP=1202247473
channel c1: datafile copy complete, elapsed time: 01:04:12
channel c1: starting datafile copy
input datafile file number=00026 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-26_0n3q6qq7
output file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.307.1
202247457 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=156 STAMP=1202251305
channel c2: datafile copy complete, elapsed time: 01:04:15
channel c2: starting datafile copy
input datafile file number=00029 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-29_0o3q6v5h
output file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.306.1
202247457 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=157 STAMP=1202251305
channel c3: datafile copy complete, elapsed time: 01:04:15
channel c3: starting datafile copy
input datafile file number=00030 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-30_0p3q6v6b
output file
```

```
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.305.1
202247473 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=158 STAMP=1202251311
channel c4: datafile copy complete, elapsed time: 01:04:01
channel c4: starting datafile copy
input datafile file number=00034 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-34_0q3q6v7o
output file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.304.1
202247477 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=159 STAMP=1202251313
channel c1: datafile copy complete, elapsed time: 01:03:59
channel c1: starting datafile copy
input datafile file number=00037 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-37_0r3q6vhu
output file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.302.1
202251311 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=160 STAMP=1202255139
channel c3: datafile copy complete, elapsed time: 01:03:48
channel c3: starting datafile copy
input datafile file number=00039 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-39_0s3q73th
output file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.303.1
202251311 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=161 STAMP=1202255150
channel c2: datafile copy complete, elapsed time: 01:04:04
channel c2: starting datafile copy
input datafile file number=00042 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-42_0t3q73uv
output file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.301.1
202251313 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=162 STAMP=1202255155
channel c4: datafile copy complete, elapsed time: 01:04:03
channel c4: starting datafile copy
input datafile file number=00047 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-47_0u3q747i
output file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.299.1
202251315 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=163 STAMP=1202255166
channel c1: datafile copy complete, elapsed time: 01:04:17
channel c1: starting datafile copy
input datafile file number=00048 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-48_0v3q74cd
output file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.298.1
202255157 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=164 STAMP=1202258984
channel c2: datafile copy complete, elapsed time: 01:03:51
channel c2: starting datafile copy
```

```
input datafile file number=00024 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-24_103q78l8
output file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.297.1
202255157 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=165 STAMP=1202258992
channel c4: datafile copy complete, elapsed time: 01:03:59
channel c4: starting datafile copy
input datafile file number=00027 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-27_113q78nk
output file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.296.1
202255171 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=166 STAMP=1202259002
channel c1: datafile copy complete, elapsed time: 01:03:59
channel c1: starting datafile copy
input datafile file number=00031 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-31_123q791p
output file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.300.1
202255141 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=167 STAMP=1202259003
channel c3: datafile copy complete, elapsed time: 01:04:30
channel c3: starting datafile copy
input datafile file number=00035 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-35_133q795m
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.295.1
202258989 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=168 STAMP=1202262811
channel c2: datafile copy complete, elapsed time: 01:03:49
channel c2: starting datafile copy
input datafile file number=00038 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-38_143q7dd7
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.294.1
202258997 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=169 STAMP=1202262817
channel c4: datafile copy complete, elapsed time: 01:03:43
channel c4: starting datafile copy
input datafile file number=00040 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-40_153q7did
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.292.1
202259011 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=170 STAMP=1202262857
channel c3: datafile copy complete, elapsed time: 01:04:13
channel c3: starting datafile copy
input datafile file number=00043 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-43_163q7dqp
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.293.1
```

```
202259011 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=171 STAMP=1202262866
channel c1: datafile copy complete, elapsed time: 01:04:16
channel c1: starting datafile copy
input datafile file number=00045 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-45_173q7e17
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.291.1
202262817 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=172 STAMP=1202266648
channel c2: datafile copy complete, elapsed time: 01:03:56
channel c2: starting datafile copy
input datafile file number=00049 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-49_183q7i95
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.290.1
202262819 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=173 STAMP=1202266665
channel c4: datafile copy complete, elapsed time: 01:04:10
channel c4: starting datafile copy
input datafile file number=00050 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-50_193q7i95
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.288.1
202262869 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=174 STAMP=1202266695
channel c1: datafile copy complete, elapsed time: 01:03:56
channel c1: starting datafile copy
input datafile file number=00001 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-1_1a3q7ii2
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.289.1
202262865 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=175 STAMP=1202266710
channel c3: datafile copy complete, elapsed time: 01:04:08
channel c3: starting datafile copy
input datafile file number=00003 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-3_1b3q7io5
output file name=+DATA/NTAP/DATAFILE/sysaux.281.1202266713
tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=176 STAMP=1202266836
channel c3: datafile copy complete, elapsed time: 00:02:06
channel c3: starting datafile copy
input datafile file number=00004 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-4_1c3q7ipa
output file name=+DATA/NTAP/DATAFILE/system.285.1202266707
tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=177 STAMP=1202266837
channel c1: datafile copy complete, elapsed time: 00:02:14
channel c1: starting datafile copy
input datafile file number=00010 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-10_1d3q7isu
output file
```

```
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/sysaux.282
.1202266839 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=178 STAMP=1202266904
channel c1: datafile copy complete, elapsed time: 00:01:15
channel c1: starting datafile copy
input datafile file number=00014 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-14_1e3q7itp
output file name=+DATA/NTAP/DATAFILE/undotbs1.283.1202266839
tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=179 STAMP=1202266919
channel c3: datafile copy complete, elapsed time: 00:01:24
channel c3: starting datafile copy
input datafile file number=00018 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-18_1f3q7j0e
output file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/sysaux.280
.1202266915 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=180 STAMP=1202266976
channel c1: datafile copy complete, elapsed time: 00:01:03
channel c1: starting datafile copy
input datafile file number=00006 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-6_1g3q7j0e
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/sysaux.276
.1202266923 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=181 STAMP=1202266987
channel c3: datafile copy complete, elapsed time: 00:01:10
channel c3: starting datafile copy
input datafile file number=00009 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-9_1h3q7j35
output file
name=+DATA/NTAP/35AD01790801A78FE063060B460ABC41/DATAFILE/sysaux.278
.1202266977 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=182 STAMP=1202267033
channel c1: datafile copy complete, elapsed time: 00:01:00
channel c1: starting datafile copy
input datafile file number=00013 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-13_1i3q7j3d
output file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/system.277
.1202266995 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=183 STAMP=1202267043
channel c3: datafile copy complete, elapsed time: 00:00:53
channel c3: starting datafile copy
input datafile file number=00017 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-17_1j3q7j56
output file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/system.275
.1202267039 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=184 STAMP=1202267089
channel c1: datafile copy complete, elapsed time: 00:00:53
channel c1: starting datafile copy
input datafile file number=00005 name=/nfsgcnv/oracopy/data_D-
```

```
NTAP_I-1379265854_TS-SYSTEM_FNO-5_1k3q7j5a
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/system.271
.1202267047 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=185 STAMP=1202267099
channel c3: datafile copy complete, elapsed time: 00:01:00
channel c3: starting datafile copy
input datafile file number=00011 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-11_1l3q7j80
output file
name=+DATA/NTAP/35AD01790801A78FE063060B460ABC41/DATAFILE/system.273
.1202267093 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=186 STAMP=1202267137
channel c1: datafile copy complete, elapsed time: 00:00:51
channel c1: starting datafile copy
input datafile file number=00008 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-8_1m3q7j82
output file
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/undotbs1.2
72.1202267109 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=187
STAMP=1202267138
channel c3: datafile copy complete, elapsed time: 00:00:35
channel c3: starting datafile copy
input datafile file number=00015 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-15_1n3q7j9p
output file
name=+DATA/NTAP/35AD01790801A78FE063060B460ABC41/DATAFILE/undotbs1.2
68.1202267143 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=188
STAMP=1202267172
channel c1: datafile copy complete, elapsed time: 00:00:36
channel c1: starting datafile copy
input datafile file number=00019 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-19_1o3q7j9p
output file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/undotbs1.2
60.1202267143 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=189
STAMP=1202267172
channel c3: datafile copy complete, elapsed time: 00:00:35
channel c3: starting datafile copy
input datafile file number=00007 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-7_1p3q7jbg
output file name=+DATA/NTAP/DATAFILE/users.266.1202267179
tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=190 STAMP=1202267179
channel c3: datafile copy complete, elapsed time: 00:00:01
channel c3: starting datafile copy
input datafile file number=00012 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-12_1q3q7jbh
output file
```

```
name=+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/users.259.
1202267181 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=191 STAMP=1202267182
channel c3: datafile copy complete, elapsed time: 00:00:03
channel c3: starting datafile copy
input datafile file number=00016 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-16_1r3q7jbi
output file
name=+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/users.258.
1202267185 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=192 STAMP=1202267185
channel c3: datafile copy complete, elapsed time: 00:00:03
channel c3: starting datafile copy
input datafile file number=00020 name=/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-20_1s3q7jbi
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/users.257.
1202267189 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=193 STAMP=1202267190
channel c3: datafile copy complete, elapsed time: 00:00:03
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/undotbs1.2
67.1202267179 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=194
STAMP=1202267199
channel c1: datafile copy complete, elapsed time: 00:00:24
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.287.1
202266655 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=195 STAMP=1202268827
channel c2: datafile copy complete, elapsed time: 00:36:19
output file
name=+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.286.1
202266669 tag=ORACOPYBKUPONGCNV_LEVEL_0 RECID=196 STAMP=1202268833
channel c4: datafile copy complete, elapsed time: 00:36:14
Finished backup at 28-MAY-25

Starting Control File and SPFILE Autobackup at 28-MAY-25
piece
handle=/nfsgcnv/archlog/NTAP/autobackup/2025_05_28/o1_mf_s_120226884
2_n3f11d04_.bkp comment=NONE
Finished Control File and SPFILE Autobackup at 28-MAY-25
released channel: c1
released channel: c2
released channel: c3
released channel: c4
```

```
RMAN> **end-of-file**

RMAN>
```

5. 驗證現在在主儲存體上是否建立了新的 VLDB 映像副本。

```
RMAN> list copy of database;

List of Datafile Copies
========================

Key     File S Completion Time Ckp SCN    Ckp Time        Sparse
------- ---- - --------------- ---------- --------------- ------
177     1    A 28-MAY-25       2951405    28-MAY-25       NO
        Name: +DATA/NTAP/DATAFILE/system.285.1202266707
        Tag: ORACOPYBKUPONGCNV_LEVEL_0

176     3    A 28-MAY-25       2951427    28-MAY-25       NO
        Name: +DATA/NTAP/DATAFILE/sysaux.281.1202266713
        Tag: ORACOPYBKUPONGCNV_LEVEL_0

179     4    A 28-MAY-25       2951801    28-MAY-25       NO
        Name: +DATA/NTAP/DATAFILE/undotbs1.283.1202266839
        Tag: ORACOPYBKUPONGCNV_LEVEL_0

186     5    A 28-MAY-25       2377077    21-MAY-25       NO
        Name:
+DATA/NTAP/35AD01790801A78FE063060B460ABC41/DATAFILE/system.273.1202
267093
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 2, PDB Name: PDB$SEED

182     6    A 28-MAY-25       2377077    21-MAY-25       NO
        Name:
+DATA/NTAP/35AD01790801A78FE063060B460ABC41/DATAFILE/sysaux.278.1202
266977
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 2, PDB Name: PDB$SEED

190     7    A 28-MAY-25       2952103    28-MAY-25       NO
        Name: +DATA/NTAP/DATAFILE/users.266.1202267179
        Tag: ORACOPYBKUPONGCNV_LEVEL_0

188     8    A 28-MAY-25       2377077    21-MAY-25       NO
        Name:
+DATA/NTAP/35AD01790801A78FE063060B460ABC41/DATAFILE/undotbs1.268.12
02267143
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 2, PDB Name: PDB$SEED
```

```
183     9    A 28-MAY-25       2951919    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/system.277.1202
266995
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

178     10   A 28-MAY-25       2951806    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/sysaux.282.1202
266839
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

187     11   A 28-MAY-25       2952000    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/undotbs1.272.12
02267109
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

191     12   A 28-MAY-25       2952108    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/users.259.12022
67181
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

184     13   A 28-MAY-25       2951954    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/system.275.1202
267039
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

180     14   A 28-MAY-25       2951863    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/sysaux.280.1202
266915
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

189     15   A 28-MAY-25       2952084    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/undotbs1.260.12
02267143
```

```
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

192     16   A 28-MAY-25       2952113    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/users.258.12022
67185
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

185     17   A 28-MAY-25       2951961    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/system.271.1202
267047
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

181     18   A 28-MAY-25       2951870    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/sysaux.276.1202
266923
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

194     19   A 28-MAY-25       2952099    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/undotbs1.267.12
02267179
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

193     20   A 28-MAY-25       2952119    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/users.257.12022
67189
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

150     21   A 27-MAY-25       2912326    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.315.120223
9779
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

148     22   A 27-MAY-25       2912334    27-MAY-25       NO
```

```
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.313.120223
9779
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

158     23   A 27-MAY-25       2919519    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.305.120224
7473
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

168     24   A 28-MAY-25       2943784    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.295.120225
8989
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

149     25   A 27-MAY-25       2912330    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.311.120223
9779
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

159     26   A 27-MAY-25       2919524    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.304.120224
7477
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

169     27   A 28-MAY-25       2943790    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.294.120225
8997
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

151     28   A 27-MAY-25       2912331    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.314.120223
9779
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
```

```
        Container ID: 3, PDB Name: NTAP_PDB1

161     29   A 27-MAY-25       2936579    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.303.120225
1311
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

160     30   A 27-MAY-25       2936583    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.302.120225
1311
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

171     31   A 28-MAY-25       2943799    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.293.120225
9011
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

153     32   A 27-MAY-25       2915938    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.312.120224
3617
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

152     33   A 27-MAY-25       2915943    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.310.120224
3619
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

162     34   A 27-MAY-25       2936588    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.301.120225
1313
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

170     35   A 28-MAY-25       2943803    28-MAY-25       NO
        Name:
```

```
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.292.120225
9011
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

155     36   A 27-MAY-25       2915949    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.309.120224
3625
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

163     37   A 27-MAY-25       2936592    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.299.120225
1315
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

172     38   A 28-MAY-25       2947486    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.291.120226
2817
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

167     39   A 28-MAY-25       2940255    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.300.120225
5141
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

173     40   A 28-MAY-25       2947490    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.290.120226
2819
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

154     41   A 27-MAY-25       2915970    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.308.120224
3631
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1
```

```
164     42   A 28-MAY-25       2940264    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.298.120225
5157
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

175     43   A 28-MAY-25       2947509    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.289.120226
2865
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

156     44   A 27-MAY-25       2919491    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.307.120224
7457
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

174     45   A 28-MAY-25       2947515    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.288.120226
2869
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

157     46   A 27-MAY-25       2919495    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.306.120224
7457
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

165     47   A 28-MAY-25       2940268    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.297.120225
5157
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

166     48   A 28-MAY-25       2940277    27-MAY-25       NO
        Name:
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.296.120225
5171
```

```
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

195     49   A 28-MAY-25       2951380    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.287.120226
6655
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

196     50   A 28-MAY-25       2951389    28-MAY-25       NO
        Name:
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.286.120226
6669
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3
```

6. 在測試表中插入新的測試行，並驗證還原到主儲存上的影像副本是否可以恢復所有交易。

```
[oracle@orap ~]$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Wed May 28 20:04:53
2025
Version 19.18.0.0.0

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Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Version 19.18.0.0.0

SQL> show pdbs

    CON_ID CON_NAME                       OPEN MODE  RESTRICTED
---------- ------------------------------ ---------- ----------
         2 PDB$SEED                       READ ONLY  NO
         3 NTAP_PDB1                      READ WRITE NO
         4 NTAP_PDB2                      READ WRITE NO
         5 NTAP_PDB3                      READ WRITE NO
SQL> alter session set container=ntap_pdb1;

Session altered.

SQL> select * from test;
```

```
        ID
----------
DT
---------------------------------------------------------------------
-------
EVENT
---------------------------------------------------------------------
------------
         1
27-MAY-25 05.35.44.000000 PM
validate a full recovery after a switch to DB backup copy


SQL> insert into test values(2, sysdate, 'Swing database back to
primary storage from nfs backup mount on GCNV');

1 row created.

SQL> commit;

Commit complete.

SQL> select * from test;

        ID
----------
DT
---------------------------------------------------------------------
-------
EVENT
---------------------------------------------------------------------
------------
         1
27-MAY-25 05.35.44.000000 PM
validate a full recovery after a switch to DB backup copy on GCNV

         2
28-MAY-25 08.09.34.000000 PM
Swing database back to primary storage from nfs backup mount on GCNV

        ID
----------
DT
---------------------------------------------------------------------
-------
```

```
EVENT
-----------------------------------------------------------------
------------


SQL>
```

7. 從 RMAN 關閉資料庫以切換回主儲存體上的備份映像副本。

```
[oracle@orap ~]$ rman target / nocatalog

Recovery Manager: Release 19.0.0.0.0 - Production on Wed May 28
20:01:55 2025
Version 19.18.0.0.0

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reserved.

connected to target database: NTAP (DBID=1379265854)
using target database control file instead of recovery catalog

RMAN> shutdown abort;

Oracle instance shut down

RMAN> startup mount;

connected to target database (not started)
Oracle instance started
database mounted

Total System Global Area    5620363744 bytes

Fixed Size                     9175520 bytes
Variable Size               1023410176 bytes
Database Buffers            4580179968 bytes
Redo Buffers                   7598080 bytes

RMAN> switch database to copy;

datafile 1 switched to datafile copy
"+DATA/NTAP/DATAFILE/system.285.1202266707"
datafile 3 switched to datafile copy
"+DATA/NTAP/DATAFILE/sysaux.281.1202266713"
datafile 4 switched to datafile copy
"+DATA/NTAP/DATAFILE/undotbs1.283.1202266839"
```

```
datafile 5 switched to datafile copy
"+DATA/NTAP/35AD01790801A78FE063060B460ABC41/DATAFILE/system.273.120
2267093"
datafile 6 switched to datafile copy
"+DATA/NTAP/35AD01790801A78FE063060B460ABC41/DATAFILE/sysaux.278.120
2266977"
datafile 7 switched to datafile copy
"+DATA/NTAP/DATAFILE/users.266.1202267179"
datafile 8 switched to datafile copy
"+DATA/NTAP/35AD01790801A78FE063060B460ABC41/DATAFILE/undotbs1.268.1
202267143"
datafile 9 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/system.277.120
2266995"
datafile 10 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/sysaux.282.120
2266839"
datafile 11 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/undotbs1.272.1
202267109"
datafile 12 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/users.259.1202
267181"
datafile 13 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/system.275.120
2267039"
datafile 14 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/sysaux.280.120
2266915"
datafile 15 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/undotbs1.260.1
202267143"
datafile 16 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/users.258.1202
267185"
datafile 17 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/system.271.120
2267047"
datafile 18 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/sysaux.276.120
2266923"
datafile 19 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/undotbs1.267.1
202267179"
datafile 20 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/users.257.1202
```

```
267189"
datafile 21 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.315.12022
39779"
datafile 22 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.313.12022
39779"
datafile 23 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.305.12022
47473"
datafile 24 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.295.12022
58989"
datafile 25 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.311.12022
39779"
datafile 26 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.304.12022
47477"
datafile 27 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.294.12022
58997"
datafile 28 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.314.12022
39779"
datafile 29 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.303.12022
51311"
datafile 30 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.302.12022
51311"
datafile 31 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.293.12022
59011"
datafile 32 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.312.12022
43617"
datafile 33 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.310.12022
43619"
datafile 34 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.301.12022
51313"
datafile 35 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.292.12022
59011"
```

```
datafile 36 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.309.12022
43625"
datafile 37 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.299.12022
51315"
datafile 38 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.291.12022
62817"
datafile 39 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.300.12022
55141"
datafile 40 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.290.12022
62819"
datafile 41 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.308.12022
43631"
datafile 42 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.298.12022
55157"
datafile 43 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.289.12022
62865"
datafile 44 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.307.12022
47457"
datafile 45 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.288.12022
62869"
datafile 46 switched to datafile copy
"+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.306.12022
47457"
datafile 47 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.297.12022
55157"
datafile 48 switched to datafile copy
"+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.296.12022
55171"
datafile 49 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.287.12022
66655"
datafile 50 switched to datafile copy
"+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.286.12022
66669"
```

```
RMAN> recover database;

Starting recover at 28-MAY-25
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=139 device type=DISK

starting media recovery
media recovery complete, elapsed time: 00:00:07

Finished recover at 28-MAY-25

RMAN> alter database open;

Statement processed

RMAN>
```

8. 驗證資料庫現在是否已返回主儲存。

```
RMAN> report schema;

Report of database schema for database with db_unique_name NTAP

List of Permanent Datafiles
===========================
File Size(MB) Tablespace           RB segs Datafile Name
---- -------- -------------------- ------- ------------------------
1    1070     SYSTEM               YES
+DATA/NTAP/DATAFILE/system.285.1202266707
3    1020     SYSAUX               NO
+DATA/NTAP/DATAFILE/sysaux.281.1202266713
4    680      UNDOTBS1             YES
+DATA/NTAP/DATAFILE/undotbs1.283.1202266839
5    400      PDB$SEED:SYSTEM      NO
+DATA/NTAP/35AD01790801A78FE063060B460ABC41/DATAFILE/system.273.1202
267093
6    460      PDB$SEED:SYSAUX      NO
+DATA/NTAP/35AD01790801A78FE063060B460ABC41/DATAFILE/sysaux.278.1202
266977
7    5        USERS                NO
+DATA/NTAP/DATAFILE/users.266.1202267179
8    235      PDB$SEED:UNDOTBS1    NO
+DATA/NTAP/35AD01790801A78FE063060B460ABC41/DATAFILE/undotbs1.268.12
02267143
9    410      NTAP_PDB1:SYSTEM     YES
```

```
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/system.277.1202
266995
10   510      NTAP_PDB1:SYSAUX     NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/sysaux.282.1202
266839
11   240      NTAP_PDB1:UNDOTBS1   YES
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/undotbs1.272.12
02267109
12   5        NTAP_PDB1:USERS      NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/users.259.12022
67181
13   410      NTAP_PDB2:SYSTEM     YES
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/system.275.1202
267039
14   510      NTAP_PDB2:SYSAUX     NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/sysaux.280.1202
266915
15   235      NTAP_PDB2:UNDOTBS1   YES
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/undotbs1.260.12
02267143
16   5        NTAP_PDB2:USERS      NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/users.258.12022
67185
17   410      NTAP_PDB3:SYSTEM     YES
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/system.271.1202
267047
18   510      NTAP_PDB3:SYSAUX     NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/sysaux.276.1202
266923
19   235      NTAP_PDB3:UNDOTBS1   YES
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/undotbs1.267.12
02267179
20   5        NTAP_PDB3:USERS      NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/users.257.12022
67189
21   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.315.120223
9779
22   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.313.120223
9779
23   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.305.120224
7473
24   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.295.120225
```

```
8989
25   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.311.120223
9779
26   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.304.120224
7477
27   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.294.120225
8997
28   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.314.120223
9779
29   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.303.120225
1311
30   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.302.120225
1311
31   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.293.120225
9011
32   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.312.120224
3617
33   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.310.120224
3619
34   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.301.120225
1313
35   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.292.120225
9011
36   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.309.120224
3625
37   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.299.120225
1315
38   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.291.120226
2817
39   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.300.120225
5141
```

```
40   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.290.120226
2819
41   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.308.120224
3631
42   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.298.120225
5157
43   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.289.120226
2865
44   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.307.120224
7457
45   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.288.120226
2869
46   30720    NTAP_PDB1:SOE1       NO
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/DATAFILE/soe1.306.120224
7457
47   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.297.120225
5157
48   30720    NTAP_PDB2:SOE2       NO
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/DATAFILE/soe2.296.120225
5171
49   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.287.120226
6655
50   30720    NTAP_PDB3:SOE3       NO
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/DATAFILE/soe3.286.120226
6669

List of Temporary Files
=======================
File Size(MB) Tablespace           Maxsize(MB) Tempfile Name
---- -------- -------------------- ----------- --------------------
1    123      TEMP                 32767
+DATA/NTAP/TEMPFILE/temp.265.1201727469
2    123      PDB$SEED:TEMP        32767
+DATA/NTAP/35AD01790801A78FE063060B460ABC41/TEMPFILE/temp.269.120172
8335
3    16384    NTAP_PDB1:TEMP       32767
+DATA/NTAP/35AD38314E81AF11E063060B460AE362/TEMPFILE/temp.274.120172
9271
```

```
4    30720    NTAP_PDB2:TEMP       32767
+DATA/NTAP/35AD39A949B7AF76E063060B460A61D2/TEMPFILE/temp.279.120172
9295
5    30720    NTAP_PDB3:TEMP       32767
+DATA/NTAP/35AD3B0BAD41AFCEE063060B460AD1CC/TEMPFILE/temp.284.120172
9319
```

9. 從 sqlplus 驗證測試表中所有交易均已復原。

```
SQL> alter session set container=ntap_pdb1;

Session altered.

SQL> select * from test;

        ID
----------
DT
---------------------------------------------------------------------------
-------
EVENT
---------------------------------------------------------------------------
------------
         1
27-MAY-25 05.35.44.000000 PM
validate a full recovery after a switch to DB backup copy on GCNV

         2
28-MAY-25 08.09.34.000000 PM
Swing database back to primary storage from nfs backup mount on GCNV

        ID
----------
DT
---------------------------------------------------------------------------
-------
EVENT
---------------------------------------------------------------------------
------------


SQL> select systimestamp from dual;

SYSTIMESTAMP
---------------------------------------------------------------------------
-------
28-MAY-25 08.17.55.895654 PM +00:00

SQL>
```

10. 最後，刪除 GCNV 備份儲存體上過時的 DB 映像副本，並在 GCNV 備份儲存體上建立新的備份映像以完成循環。

遺失所有 Oracle 檔案的時間點恢復

如果發生故障，導致主儲存和/或主資料庫伺服器主機遺失，則存檔日誌檔案中沒有的所有交易都會遺失。但是，GCNV NFS 檔案系統上提供的 Oracle 資料庫備份映像副本非常方便。您可以使用備份映像副本將主資料庫快速還原到同一個主資料庫伺服器或備用資料庫伺服器（如果有）。在本節中，我們將演示還原到主資料庫伺服器的逐步過程。恢復到新的備用資料庫伺服器的方法幾乎相同；但是，必須在安裝和配置相同的 Oracle 軟體堆疊的備用資料庫伺服器上安裝資料庫備份映像副本。

1. 在我們先前建立的測試表中插入一行，以進行 Oracle VLDB 時間點復原驗證。

```
SQL> insert into test values(3, sysdate, 'validate a point-in-time
recovery by switching to DB backup copy on GCNV');

1 row created.

SQL> commit;

Commit complete.

SQL> select * from test;

        ID
----------
DT
---------------------------------------------------------------------------
-------
EVENT
---------------------------------------------------------------------------
------------
         1
27-MAY-25 05.35.44.000000 PM
validate a full recovery after a switch to DB backup copy on GCNV

         2
28-MAY-25 08.09.34.000000 PM
Swing database back to primary storage from nfs backup mount on GCNV

        ID
----------
DT
---------------------------------------------------------------------------
-------
EVENT
---------------------------------------------------------------------------
------------

         3
29-MAY-25 03.22.22.000000 PM
validate a point-in-time recovery by switching to DB backup copy on
GCNV
```

2. 歸檔目前日誌文件，以便將交易推送到歸檔日誌檔案。

```
SQL> alter session set container=cdb$root;

Session altered.

SQL> alter system archive log current;

System altered.
```

3. 關閉主 VLDB 伺服器主機以模擬儲存和 DB 伺服器主機的完全故障。
4. 如果在備用資料庫伺服器上執行恢復，請確保它與主資料庫伺服器主機具有相同的作業系統、相同的版本，並且作業系統核心已修補。此外，已在僅使用軟體選項的備用資料庫伺服器上安裝和設定了相同版本和修補程式的 Oracle。
5. 另外，在備用資料庫伺服器上配置與主資料庫伺服器類似的 oracle 環境，例如 oratab 和 oracle 使用者 .bash_profile 等。將這些檔案備份到 GCNV NFS 掛載點是一個很好的做法。
6. 然後將 GCNV NFS 檔案系統上的 Oracle 資料庫備份映像副本安裝在備用 DB 伺服器上以進行還原。以下步驟示範了流程的細節。

   以管理員使用者身分建立掛載點。

   ```
   sudo mkdir /nfsgcnv
   ```

   以管理員使用者身分掛載儲存 Oracle VLDB 備份映像副本的 NFS 磁碟區。

   ```
   sudo mount 10.165.128.5:/orap-bkup /nfsgcnv -o
   rw,bg,hard,vers=3,proto=tcp,timeo=600,rsize=262144,wsize=262144
   ```

7. 驗證 GCNV NFS 掛載上可用的 Oracle 存檔日誌以進行恢復，並記下最後一個日誌檔案日誌序號。在我們的測試案例中，這個數字是 27。我們的復原點最多到日誌序號 28。
8. 如果從備用資料庫主機恢復，以 oracle 使用者身份，將 ORACLE_HOME 變數設定為備用資料庫伺服器上的目前 Oracle 安裝，將 ORACLE_SID 設定為主 Oracle 實例 SID。本次測試中為NTAP。

   ```
   [oracle@ora-02 ~]$ export
   ORACLE_HOME=/u01/app/oracle/product/19.0.0/NTAP
   [oracle@ora-02 ~]$ export ORACLE_SID=NTAP
   [oracle@ora-02 ~]$ export PATH=$PATH:$ORACLE_HOME/bin
   ```

9. 以 oracle 使用者身份，在 $ORACLE_HOME/dbs 目錄中建立一個通用 Oracle 初始化文件，並配置適當的管理目錄。最重要的是，擁有 Oracle `flash recovery area`**指向主** `Oracle VLDB` **伺服器中定義的** `GCNV NFS` **掛載路徑。** `flash recovery area`**配置在章節中進行了演示** `Setup Oracle RMAN incremental merge to image copy on GCNV for in-server VLDB backup`。將 Oracle 控制檔設定為 GCNV NFS 備份檔案系統。

```
vi /home/oracle/initNTAP.ora
```

使用以下範例條目：

```
*.audit_file_dest='/u01/app/oracle/admin/NTAP/adump'
*.audit_trail='db'
*.compatible='19.0.0'
*.control_files=('/nfsgcnv/oracopy/NTAP.ctl')
*.db_block_size=8192
*.db_create_file_dest='/nfsgcnv/oracopy/'
*.db_name='NTAP'
*.db_recovery_file_dest_size=85899345920
*.db_recovery_file_dest='/nfsgcnv/archlog/'
*.diagnostic_dest='/u01/app/oracle'
*.enable_pluggable_database=true
*.local_listener='LISTENER'
*.nls_language='AMERICAN'
*.nls_territory='AMERICA'
*.pga_aggregate_target=1024m
*.processes=320
*.remote_login_passwordfile='EXCLUSIVE'
*.sga_target=10240m
```

如果出現差異，則應使用從主 Oracle VLDB 伺服器復原的備份初始化檔案取代上述初始化檔案。

10. 以 oracle 使用者身分啟動 RMAN 在主或備用 DB 伺服器主機上執行 Oracle 復原。首先，啟動 Oracle 實例 `nomount`狀態。

```
[oracle@orap ~]$ rman target / nocatalog

Recovery Manager: Release 19.0.0.0.0 - Production on Thu May 29
15:46:15 2025
Version 19.18.0.0.0

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reserved.

connected to target database (not started)

RMAN> startup nomount pfile='/home/oracle/initNTAP.ora';

Oracle instance started

Total System Global Area   10737418000 bytes

Fixed Size                     9174800 bytes
Variable Size               1577058304 bytes
Database Buffers            9126805504 bytes
Redo Buffers                  24379392 bytes
```

11. 設定資料庫ID。可以從 GCNV NFS 掛載點上的映像副本的 Oracle 檔案名稱中檢索資料庫 ID。

```
RMAN> set dbid = 1379265854;

executing command: SET DBID
```

12. 從自動備份還原控製檔。如果啟用了 Oracle 控製檔案和 spfile 自動備份，則它們會在每個增量備份和合併週期中備份。如果有多個副本可用，將還原最新的備份。

```
RMAN> restore controlfile from autobackup;

Starting restore at 29-MAY-25
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=2 device type=DISK

recovery area destination: /nfsgcnv/archlog/
database name (or database unique name) used for search: NTAP
channel ORA_DISK_1: AUTOBACKUP
/nfsgcnv/archlog/NTAP/autobackup/2025_05_29/o1_mf_s_1202395822_n3jx1
hnf_.bkp found in the recovery area
channel ORA_DISK_1: looking for AUTOBACKUP on day: 20250529
channel ORA_DISK_1: restoring control file from AUTOBACKUP
/nfsgcnv/archlog/NTAP/autobackup/2025_05_29/o1_mf_s_1202395822_n3jx1
hnf_.bkp
channel ORA_DISK_1: control file restore from AUTOBACKUP complete
output file name=/nfsgcnv/oracopy/NTAP.ctl
Finished restore at 29-MAY-25
```

13. 將初始化檔案從 spfile 還原到 $ORACLE_HOME/dbs 資料夾，以便稍後更新參數檔案以與主 VLDB 相符。

```
RMAN> restore spfile to pfile
'/u01/app/oracle/product/19.0.0/NTAP/dbs/initNTAP.ora' from
autobackup;

Starting restore at 29-MAY-25
using channel ORA_DISK_1

recovery area destination: /nfsgcnv/archlog/
database name (or database unique name) used for search: NTAP
channel ORA_DISK_1: AUTOBACKUP
/nfsgcnv/archlog/NTAP/autobackup/2025_05_29/o1_mf_s_1202395822_n3jx1
hnf_.bkp found in the recovery area
channel ORA_DISK_1: looking for AUTOBACKUP on day: 20250529
channel ORA_DISK_1: restoring spfile from AUTOBACKUP
/nfsgcnv/archlog/NTAP/autobackup/2025_05_29/o1_mf_s_1202395822_n3jx1
hnf_.bkp
channel ORA_DISK_1: SPFILE restore from AUTOBACKUP complete
Finished restore at 29-MAY-25
```

14. 掛載控制檔並驗證資料庫備份映像副本。

```
RMAN> alter database mount;
```

```
released channel: ORA_DISK_1
Statement processed

RMAN> list copy of database tag 'ORACOPYBKUPONGCNV_LEVEL_0';

List of Datafile Copies
=======================

Key     File S Completion Time Ckp SCN    Ckp Time        Sparse
------- ---- - --------------- ---------- --------------- ------
273     1    A 29-MAY-25       3310055    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-1_6j3ql96a
        Tag: ORACOPYBKUPONGCNV_LEVEL_0

274     3    A 29-MAY-25       3310333    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-3_6k3ql9c3
        Tag: ORACOPYBKUPONGCNV_LEVEL_0

275     4    A 29-MAY-25       3310521    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
UNDOTBS1_FNO-4_6l3ql9hu
        Tag: ORACOPYBKUPONGCNV_LEVEL_0

283     5    A 29-MAY-25       2377077    21-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-5_6t3qlaa4
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 2, PDB Name: PDB$SEED

279     6    A 29-MAY-25       2377077    21-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-6_6p3ql9vu
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 2, PDB Name: PDB$SEED

288     7    A 29-MAY-25       3311276    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
USERS_FNO-7_723qlaif
        Tag: ORACOPYBKUPONGCNV_LEVEL_0

285     8    A 29-MAY-25       2377077    21-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
UNDOTBS1_FNO-8_6v3qlae9
```

```
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 2, PDB Name: PDB$SEED

280     9    A 29-MAY-25       3310854    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-9_6q3qla21
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

276     10   A 29-MAY-25       3310587    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-10_6m3ql9lh
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

284     11   A 29-MAY-25       3311150    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
UNDOTBS1_FNO-11_6u3qlacg
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

289     12   A 29-MAY-25       3311281    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
USERS_FNO-12_733qlaij
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

281     13   A 29-MAY-25       3310906    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-13_6r3qla52
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

277     14   A 29-MAY-25       3310662    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-14_6n3ql9ou
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

286     15   A 29-MAY-25       3311229    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
UNDOTBS1_FNO-15_703qlaft
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

290     16   A 29-MAY-25       3311286    29-MAY-25       NO
```

```
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
USERS_FNO-16_743qlaik
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

282     17   A 29-MAY-25       3311063    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSTEM_FNO-17_6s3qla7n
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

278     18   A 29-MAY-25       3310747    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
SYSAUX_FNO-18_6o3ql9s9
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

287     19   A 29-MAY-25       3311242    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
UNDOTBS1_FNO-19_713qlago
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

291     20   A 29-MAY-25       3311290    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-
USERS_FNO-20_753qlail
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

251     21   A 28-MAY-25       3261788    28-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
21_5o3qkcd8
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

295     22   A 29-MAY-25       3261776    28-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
22_5i3qk79h
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

255     23   A 29-MAY-25       3266361    28-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
23_5v3qkh6o
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2
```

```
266     24   A 29-MAY-25       3280010    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
24_693qkvfv
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

296     25   A 29-MAY-25       3261780    28-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
25_5j3qk79h
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

257     26   A 29-MAY-25       3270370    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
26_603qklqo
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

268     27   A 29-MAY-25       3280164    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
27_6a3qkvj9
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

297     28   A 29-MAY-25       3261784    28-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
28_5k3qk79h
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

258     29   A 29-MAY-25       3270566    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
29_613qkm09
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

259     30   A 29-MAY-25       3270571    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
30_623qkm0g
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

267     31   A 29-MAY-25       3280168    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
31_6b3qkvj9
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
```

```
        Container ID: 5, PDB Name: NTAP_PDB3

249     32   A 28-MAY-25       3261793    28-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
32_5p3qkcd9
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

250     33   A 28-MAY-25       3261797    28-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
33_5q3qkcd9
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

260     34   A 29-MAY-25       3270587    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
34_633qkm1b
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

269     35   A 29-MAY-25       3284192    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
35_6c3ql412
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

252     36   A 28-MAY-25       3261801    28-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
36_5r3qkcda
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

261     37   A 29-MAY-25       3275627    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
37_643qkqjf
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

270     38   A 29-MAY-25       3297172    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
38_6d3ql47q
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

262     39   A 29-MAY-25       3275722    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
```

```
39_653qkqnn
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

271     40   A 29-MAY-25       3297259    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
40_6e3ql4b5
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

253     41   A 29-MAY-25       3266273    28-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
41_5s3qkh37
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

264     42   A 29-MAY-25       3275738    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
42_663qkqoq
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

272     43   A 29-MAY-25       3297314    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
43_6f3ql4bo
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

254     44   A 29-MAY-25       3266318    28-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
44_5t3qkh4m
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1

292     45   A 29-MAY-25       3309950    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
45_6g3ql91c
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

256     46   A 29-MAY-25       3266357    28-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-
46_5u3qkh6o
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 3, PDB Name: NTAP_PDB1
```

```
263     47   A 29-MAY-25       3275799    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
47_673qkqr5
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

265     48   A 29-MAY-25       3279927    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-
48_683qkvb4
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 4, PDB Name: NTAP_PDB2

293     49   A 29-MAY-25       3309965    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
49_6h3ql91s
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3

294     50   A 29-MAY-25       3310038    29-MAY-25       NO
        Name: /nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-
50_6i3ql955
        Tag: ORACOPYBKUPONGCNV_LEVEL_0
        Container ID: 5, PDB Name: NTAP_PDB3
```

15. 將資料庫切換到複製以運行恢復，而無需資料庫還原。

```
RMAN> switch database to copy;

Starting implicit crosscheck backup at 29-MAY-25
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=12 device type=DISK
Crosschecked 20 objects
Finished implicit crosscheck backup at 29-MAY-25

Starting implicit crosscheck copy at 29-MAY-25
using channel ORA_DISK_1
Crosschecked 49 objects
Finished implicit crosscheck copy at 29-MAY-25

searching for all files in the recovery area
cataloging files...
cataloging done

List of Cataloged Files
=======================
```

```
File Name:
/nfsgcnv/archlog/NTAP/archivelog/2025_05_29/o1_mf_1_27_n3jzbgh2_.arc
File Name:
/nfsgcnv/archlog/NTAP/autobackup/2025_05_29/o1_mf_s_1202395822_n3jx1
hnf_.bkp

datafile 1 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-1_6j3ql96a"
datafile 3 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-3_6k3ql9c3"
datafile 4 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-4_6l3ql9hu"
datafile 5 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-5_6t3qlaa4"
datafile 6 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-6_6p3ql9vu"
datafile 7 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-7_723qlaif"
datafile 8 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-8_6v3qlae9"
datafile 9 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-9_6q3qla21"
datafile 10 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-10_6m3ql9lh"
datafile 11 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-11_6u3qlacg"
datafile 12 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-12_733qlaij"
datafile 13 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-13_6r3qla52"
datafile 14 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-14_6n3ql9ou"
datafile 15 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-15_703qlaft"
datafile 16 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-16_743qlaik"
datafile 17 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-17_6s3qla7n"
datafile 18 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-18_6o3ql9s9"
datafile 19 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-19_713qlago"
datafile 20 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-20_753qlail"
datafile 21 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-21_5o3qkcd8"
```

```
datafile 22 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-22_5i3qk79h"
datafile 23 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-23_5v3qkh6o"
datafile 24 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-24_693qkvfv"
datafile 25 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-25_5j3qk79h"
datafile 26 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-26_603qklqo"
datafile 27 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-27_6a3qkvj9"
datafile 28 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-28_5k3qk79h"
datafile 29 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-29_613qkm09"
datafile 30 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-30_623qkm0g"
datafile 31 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-31_6b3qkvj9"
datafile 32 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-32_5p3qkcd9"
datafile 33 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-33_5q3qkcd9"
datafile 34 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-34_633qkm1b"
datafile 35 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-35_6c3ql412"
datafile 36 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-36_5r3qkcda"
datafile 37 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-37_643qkqjf"
datafile 38 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-38_6d3ql47q"
datafile 39 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-39_653qkqnn"
datafile 40 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-40_6e3ql4b5"
datafile 41 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-41_5s3qkh37"
datafile 42 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-42_663qkqoq"
datafile 43 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-43_6f3ql4bo"
datafile 44 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-44_5t3qkh4m"
```

```
datafile 45 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-45_6g3ql91c"
datafile 46 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-46_5u3qkh6o"
datafile 47 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-47_673qkqr5"
datafile 48 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-48_683qkvb4"
datafile 49 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-49_6h3ql91s"
datafile 50 switched to datafile copy "/nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-50_6i3ql955"
```

16. 執行 Oracle 復原直到閃回復原區中最後一個可用的存檔日誌。

```
RMAN> run {
2> set until sequence=28;
3> recover database;
4> }

executing command: SET until clause

Starting recover at 29-MAY-25
using channel ORA_DISK_1
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00011: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-11_6u3qlacg
destination for restore of datafile 00025: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-25_5j3qk79h
destination for restore of datafile 00036: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-36_5r3qkcda
destination for restore of datafile 00046: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-46_5u3qkh6o
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/773qm6l7_231_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/773qm6l7_231_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00012: /nfsgcnv/oracopy/data_D-
```

```
NTAP_I-1379265854_TS-USERS_FNO-12_733qlaij
destination for restore of datafile 00028: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-28_5k3qk79h
destination for restore of datafile 00041: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-41_5s3qkh37
destination for restore of datafile 00044: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-44_5t3qkh4m
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/7a3qm6l7_234_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/7a3qm6l7_234_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:02
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00015: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-15_703qlaft
destination for restore of datafile 00029: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-29_613qkm09
destination for restore of datafile 00039: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-39_653qkqnn
destination for restore of datafile 00048: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-48_683qkvb4
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/783qm6l7_232_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/783qm6l7_232_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00019: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-19_713qlago
destination for restore of datafile 00031: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-31_6b3qkvj9
destination for restore of datafile 00043: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-43_6f3ql4bo
destination for restore of datafile 00050: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-50_6i3ql955
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/793qm6l7_233_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/793qm6l7_233_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
```

```
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00010: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-10_6m3ql9lh
destination for restore of datafile 00021: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-21_5o3qkcd8
destination for restore of datafile 00032: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-32_5p3qkcd9
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/7d3qm6l9_237_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/7d3qm6l9_237_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00014: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-14_6n3ql9ou
destination for restore of datafile 00023: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-23_5v3qkh6o
destination for restore of datafile 00034: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-34_633qkm1b
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/7e3qm6l9_238_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/7e3qm6l9_238_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00016: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-16_743qlaik
destination for restore of datafile 00030: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-30_623qkm0g
destination for restore of datafile 00042: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-42_663qkqoq
destination for restore of datafile 00047: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-47_673qkqr5
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/7b3qm6l9_235_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/7b3qm6l9_235_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
```

```
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00020: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-20_753qlail
destination for restore of datafile 00035: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-35_6c3ql412
destination for restore of datafile 00045: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-45_6g3ql91c
destination for restore of datafile 00049: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-49_6h3ql91s
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/7c3qm6l9_236_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/7c3qm6l9_236_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00001: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-1_6j3ql96a
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/7j3qm6la_243_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/7j3qm6la_243_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00009: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-9_6q3qla21
destination for restore of datafile 00022: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-22_5i3qk79h
destination for restore of datafile 00033: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE1_FNO-33_5q3qkcd9
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/7g3qm6l9_240_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/7g3qm6l9_240_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
```

```
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00013: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-13_6r3qla52
destination for restore of datafile 00026: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-26_603qklqo
destination for restore of datafile 00037: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE2_FNO-37_643qkqjf
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/7h3qm6la_241_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/7h3qm6la_241_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00017: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSTEM_FNO-17_6s3qla7n
destination for restore of datafile 00027: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-27_6a3qkvj9
destination for restore of datafile 00040: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-40_6e3ql4b5
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/7i3qm6la_242_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/7i3qm6la_242_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00018: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-18_6o3ql9s9
destination for restore of datafile 00024: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-24_693qkvfv
destination for restore of datafile 00038: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SOE3_FNO-38_6d3ql47q
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/7f3qm6l9_239_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/7f3qm6l9_239_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
```

```
set
destination for restore of datafile 00004: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-UNDOTBS1_FNO-4_6l3ql9hu
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/7l3qm6la_245_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/7l3qm6la_245_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:02
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00007: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-USERS_FNO-7_723qlaif
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/7p3qm6lb_249_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/7p3qm6lb_249_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup
set
destination for restore of datafile 00003: /nfsgcnv/oracopy/data_D-
NTAP_I-1379265854_TS-SYSAUX_FNO-3_6k3ql9c3
channel ORA_DISK_1: reading from backup piece
/nfsgcnv/oracopy/7k3qm6la_244_1_1
channel ORA_DISK_1: piece handle=/nfsgcnv/oracopy/7k3qm6la_244_1_1
tag=ORACOPYBKUPONGCNV_LEVEL_0
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:03

starting media recovery

archived log for thread 1 with sequence 27 is already on disk as
file
/nfsgcnv/archlog/NTAP/archivelog/2025_05_29/o1_mf_1_27_n3jzbgh2_.arc
archived log file
name=/nfsgcnv/archlog/NTAP/archivelog/2025_05_29/o1_mf_1_27_n3jzbgh2
_.arc thread=1 sequence=27
media recovery complete, elapsed time: 00:00:01
Finished recover at 29-MAY-25

RMAN>
RMAN> exit
```

```
Recovery Manager complete.
```

> 為了更快地恢復，請使用 recovery_parallelism 參數啟用並行會話或在資料庫恢復的恢復命令中指定並行度： `RECOVER DATABASE PARALLEL (DEGREE d INSTANCES DEFAULT);` 。一般來說，並行度應該等於主機上的 CPU 核心數。

17. 退出 RMAN，透過 sqlplus 以 oracle 使用者登入 Oracle，以在不完全恢復後開啟資料庫並重設日誌。

```
SQL> select name, open_mode from v$database;

NAME      OPEN_MODE
--------- --------------------
NTAP      MOUNTED

SQL> select instance_name, host_name from v$instance;

INSTANCE_NAME
----------------
HOST_NAME
----------------------------------------------------------------
NTAP
orap


SQL> select member from v$logfile;

MEMBER
--------------------------------------------------------------------------------
------------
+DATA/NTAP/ONLINELOG/group_3.264.1201727425
+LOGS/NTAP/ONLINELOG/group_3.259.1201727433
+DATA/NTAP/ONLINELOG/group_2.263.1201727425
+LOGS/NTAP/ONLINELOG/group_2.257.1201727431
+DATA/NTAP/ONLINELOG/group_1.262.1201727425
+LOGS/NTAP/ONLINELOG/group_1.258.1201727433

6 rows selected.

SQL> alter database rename file
'+LOGS/NTAP/ONLINELOG/group_1.258.1201727433' to
'/nfsgcnv/oracopy/group_1.258.1201727433';

Database altered.
```

```
SQL> alter database rename file
'+DATA/NTAP/ONLINELOG/group_1.262.1201727425' to
'/nfsgcnv/oracopy/group_1.262.1201727425';

Database altered.

SQL> alter database rename file
'+LOGS/NTAP/ONLINELOG/group_2.257.1201727431' to
'/nfsgcnv/oracopy/group_2.257.1201727431';

Database altered.

SQL> alter database rename file
'+DATA/NTAP/ONLINELOG/group_2.263.1201727425' to
'/nfsgcnv/oracopy/group_2.263.1201727425';

Database altered.

SQL> alter database rename file
'+LOGS/NTAP/ONLINELOG/group_3.259.1201727433' to
'/nfsgcnv/oracopy/group_3.259.1201727433';

Database altered.

SQL> alter database rename file
'+DATA/NTAP/ONLINELOG/group_3.264.1201727425' to
'/nfsgcnv/oracopy/group_3.264.1201727425';

Database altered.

SQL> alter database open resetlogs;

Database altered.

SQL> show pdbs

    CON_ID CON_NAME                       OPEN MODE  RESTRICTED
---------- ------------------------------ ---------- ----------
         2 PDB$SEED                       READ ONLY  NO
         3 NTAP_PDB1                      READ WRITE NO
         4 NTAP_PDB2                      READ WRITE NO
         5 NTAP_PDB3                      READ WRITE NO
```

18. 驗證資料庫檔案現在位於 GCNV 上的備份檔案系統上。

```
SQL> select name from v$datafile;
```

```
NAME
------------------------------------------------------------------------
------------
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSTEM_FNO-1_6j3ql96a
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSAUX_FNO-3_6k3ql9c3
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-UNDOTBS1_FNO-4_6l3ql9hu
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSTEM_FNO-5_6t3qlaa4
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSAUX_FNO-6_6p3ql9vu
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-USERS_FNO-7_723qlaif
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-UNDOTBS1_FNO-8_6v3qlae9
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSTEM_FNO-9_6q3qla21
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSAUX_FNO-10_6m3ql9lh
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-UNDOTBS1_FNO-
11_6u3qlacg
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-USERS_FNO-12_733qlaij

NAME
------------------------------------------------------------------------
------------
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSTEM_FNO-13_6r3qla52
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSAUX_FNO-14_6n3ql9ou
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-UNDOTBS1_FNO-
15_703qlaft
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-USERS_FNO-16_743qlaik
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSTEM_FNO-17_6s3qla7n
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SYSAUX_FNO-18_6o3ql9s9
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-UNDOTBS1_FNO-
19_713qlago
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-USERS_FNO-20_753qlail
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-21_5o3qkcd8
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-22_5i3qk79h
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-23_5v3qkh6o

NAME
------------------------------------------------------------------------
------------
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-24_693qkvfv
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-25_5j3qk79h
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-26_603qklqo
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-27_6a3qkvj9
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-28_5k3qk79h
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-29_613qkm09
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-30_623qkm0g
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-31_6b3qkvj9
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-32_5p3qkcd9
```

```
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-33_5q3qkcd9
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-34_633qkm1b

NAME
--------------------------------------------------------------------------------
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-35_6c3ql412
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-36_5r3qkcda
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-37_643qkqjf
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-38_6d3ql47q
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-39_653qkqnn
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-40_6e3ql4b5
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-41_5s3qkh37
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-42_663qkqoq
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-43_6f3ql4bo
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-44_5t3qkh4m
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-45_6g3ql91c

NAME
--------------------------------------------------------------------------------
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE1_FNO-46_5u3qkh6o
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-47_673qkqr5
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE2_FNO-48_683qkvb4
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-49_6h3ql91s
/nfsgcnv/oracopy/data_D-NTAP_I-1379265854_TS-SOE3_FNO-50_6i3ql955

49 rows selected.

SQL> select member from v$logfile;

MEMBER
--------------------------------------------------------------------------------
/nfsgcnv/oracopy/group_3.264.1201727425
/nfsgcnv/oracopy/group_3.259.1201727433
/nfsgcnv/oracopy/group_2.263.1201727425
/nfsgcnv/oracopy/group_2.257.1201727431
/nfsgcnv/oracopy/group_1.262.1201727425
/nfsgcnv/oracopy/group_1.258.1201727433

6 rows selected.


SQL> select name from v$controlfile;
```

```
NAME
--------------------------------------------------------------------------------
/nfsgcnv/oracopy/NTAP.ctl
```

19. 其他恢復後任務

```
- Add GCNV NFS mount to fstab of the standby DB server if recovering
from a standby DB server so that the NFS file system will be mounted
when DB server host rebooted.

- Update pfile restored to $ORACLE_HOME/dbs directory and create
spfile from pfile.
```

20. 要恢復到主存儲，請按照第節中詳述的完全相同的步驟操作 `Reverse VLDB back to primary storage from backup copy`。如果在備用資料庫伺服器上恢復，則需要將主儲存匯入備用資料庫伺服器。還需要將 Oracle 控製文件和當前線上日誌檔案從 GCNV nfs 掛載重新定位回主存儲，這可以在幾分鐘的停機時間內完成。

這樣就完成了從 GCNV NFS 檔案系統上的備份映像副本到同一主 DB 伺服器或備用 DB 伺服器的 Oracle VLDB 資料庫時間點復原。

從備份映像副本複製 **Oracle VLDB** 以供其他用例使用

從 GCNV 上的備份映像副本複製新的 Oracle VLDB 類似於將主資料庫按時間點還原到新的 DB 伺服器。NetApp解決方案工程團隊提供了自動化工具包，以促進整個流程的快速（幾分鐘）和輕鬆實施。

以下自動化工具包包含一個劇本，可用於透過 NFS 掛載從儲存在 GCNV 儲存上的主資料庫備份映像副本建立或刷新 Oracle VLDB 的克隆，以實現完整的克隆生命週期管理。詳細內容請參考文件："透過伺服器內映像備份實現 Oracle VLDB 克隆生命週期自動化" 。

```
https://bitbucket.ngage.netapp.com/mvc/projects/NS-
BB/repos/na_oracle_bkup_clone/browse
```

目前，只有具有 bitbucket 存取權限的NetApp內部使用者才能存取該工具包。對於有興趣的外部用戶，請向您的客戶團隊要求存取權限或聯絡NetApp解決方案工程團隊。

在哪裡可以找到更多信息

要了解有關本文檔中描述的信息的更多信息，請查看以下文檔和/或網站：

- NetApp 在 Google Cloud 上提供一流的文件儲存服務

https://cloud.google.com/netapp-volumes?hl=en

- RMAN：合併增量備份策略（文件 ID 745798.1）

  "https://support.oracle.com/knowledge/Oracle%20Database%20Products/745798_1.html"

- RMAN 備份與還原使用者指南

  "https://docs.oracle.com/en/database/oracle/oracle-database/19/bradv/getting-started-rman.html"

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