

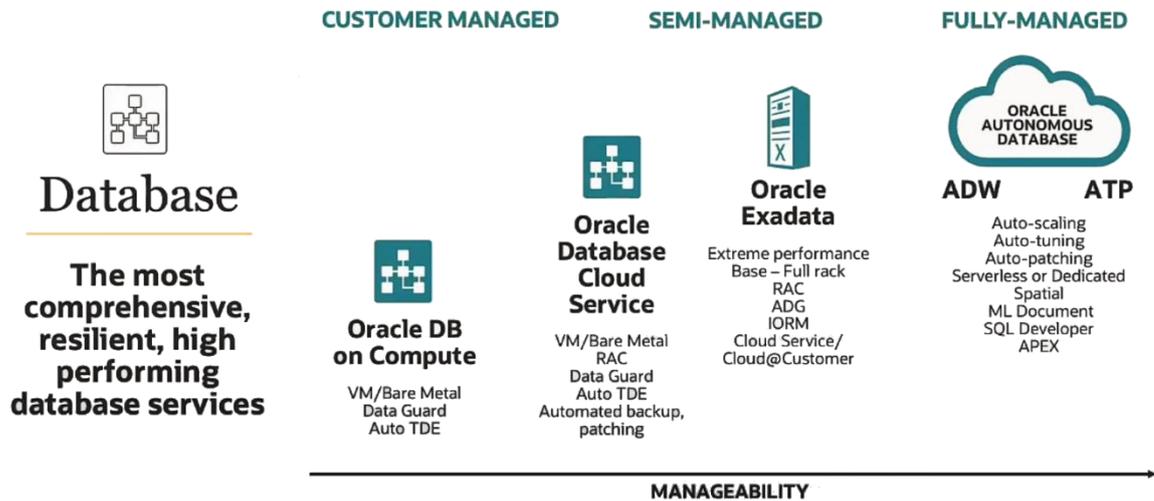
OCI DBCS Backup 與 Data Guard 介紹



壹、前言

Oracle Cloud Infrastructure (OCI) 為 Oracle 目前最先進的雲端架構平台，以其在資料庫領域的卓越領先，開發出各式各樣相關的雲端服務。在資料庫方面，從 IaaS 一路到 SaaS，OCI 均有對應的解決方案。本次跟大家介紹，在 OCI 中廣受歡迎的 Oracle Cloud Base Database Service (AKA Oracle Database Cloud Service, DBCS) 服務中，如何對 DBCS 資料庫進行備份，備份應用，以及設定 Data Guard 來保護您的 DB。

以下為 OCI 的 DB Service 種類：



貳、 關於 DBCS

Oracle Database Cloud Service (DBCS) 是 Oracle 提供的一種雲端資料庫服務，建構方式可以選用 VM (Virtual Machine) 方式或是 BM (Barre Metal) 方式，會建立出完整的 Oracle Linux + Oracle DB，DB 版本目前可以選擇 11.2 (BM only) · 12c · 19c，以及 21c · Enterprise Edition or Standard Edition。

下圖為本次示範的 DBCS 首頁，為一個 Oracle Linux 7.9 + 一個 19c 的 Enterprise Edition multitenant DB，CDB 內置一個 PDB：

Overview > Oracle Base Database > DB Systems > DB System Details

MP0349TOAD

Scale storage up Change shape Clone Add SSH keys More actions

DB system information Tags

General information

Lifecycle state: Available
Availability domain: bufl-AP-TOKYO-1-AD-1
OCID: ..yuhleq [Show](#) [Copy](#)
Shape: VM.Standard.E4.Flex
CPU core count: 4
Created: Tue, Jan 10, 2023, 08:28:43 UTC
Time zone: Asia/Taipei [🕒](#)
Compartment: mpinfotest (root)/OSDA/Steve
Oracle Database software edition: Enterprise Edition
Storage management software: Oracle Grid Infrastructure
Available data storage: 256 GB
Recovery area storage: 256 GB
Total storage size: 712 GB
Theoretical max IOPS: 19.2K
IOPS limiting factor: Storage

Network

VCN: [MP0349_VCN01](#)
Client subnet: MP0349_PublicSN01
Port: 1521
Hostname prefix: clouddb
Host domain name: pubsn01... [Show](#) [Copy](#)
SCAN DNS name: clouddb-scan... [Show](#) [Copy](#)
Network security groups: None [Edit](#)

參、使用 DBCS 的自動備份

Oracle DBCS 有提供自動備份服務，能依照設置自動對我們 DBCS 中的 DB 進行備份，並且也支援自行手動備份。DBA 可以依照實務上的需求啟用，停用，設置自動備份。進入 DBCS 的 DB 頁面後，可對該 DB 進行動備份的相關設置。

自動備份可以指定備份保留天數，可選擇保留 7 天、15 天、30 天、45 天或 60 天。可指定備份啟動時間 (若為預設 Anytime 的話，會由 OCI 在 DB 所在的 Region 當地時間 00:00 ~ 06:00 左右由系統安排進行備份)。儲存所在則為 Oracle OCI 自動規劃維護的 Object Storage。

自動備份為每週進行一次的 level 0 備份，通常是在 DB 所在當地週末進行，之後的六

天為 level 1 備份，在備份紀錄上目前是看不出來的，二者均顯示微增量備份。

下圖為 DBCS 的 DB 頁面，可看到已經設置自動備份。此範例為自動備份保留七天，

並且不設定特定備份啟動時間 (預設值)，圖中也可看最後一次備份 (完成) 時間為

21:30:36 UTC，而本 DB 所在 region 為 Tokyo，換算時間約是在當地 06:30:36 備

份完成：

The screenshot shows the Oracle Cloud console interface for a database named TOADDB. The page title is "TOADDB" and the status is "AVAILABLE". The "Backup" section is highlighted with a red box and contains the following information:

- Automatic backup: Enabled ⓘ
- Last Backup Time: Wed, Mar 22, 2023, 21:30:36 UTC ⓘ
- Backup retention period: 7 days
- Backup schedule: Anytime ⓘ

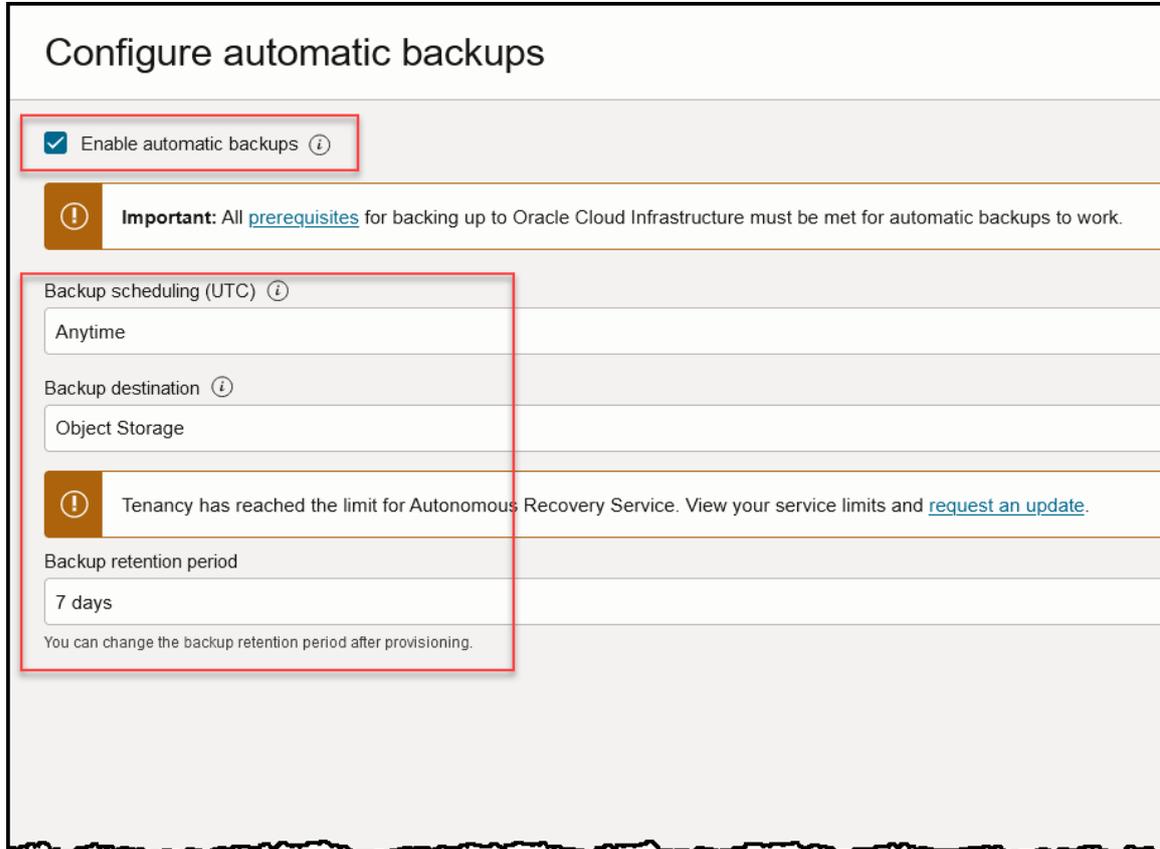
Other visible information includes:

- Database information: TOADDB
- General information: Lifecycle state: Available, OCID: ...4imxq, Created: Tue, Jan 10, 2023, 08:28:43 UTC, Database unique name: TOADDB_nrt1t7, Oracle SID Prefix: None
- Data Guard: Database Architecture: Container Database

[啟用] / [停用] / [設定] 自動備份進行的點選處：

This screenshot is identical to the one above, but with a red box highlighting the "Configure automatic backups" button in the top navigation bar. This button is used to manage the automatic backup settings for the database.

點選 [Configure automatic backup]後，彈出自動備份的相關設定，若有一些與設定相關的提醒也會在此處看到：



Configure automatic backups

Enable automatic backups ⓘ

! Important: All [prerequisites](#) for backing up to Oracle Cloud Infrastructure must be met for automatic backups to work.

Backup scheduling (UTC) ⓘ

Anytime

Backup destination ⓘ

Object Storage

! Tenancy has reached the limit for Autonomous Recovery Service. View your service limits and [request an update](#).

Backup retention period

7 days

You can change the backup retention period after provisioning.

那我們要如何檢視備份紀錄？在 DB 明細頁面的下方，點選 [Backup]，可以檢視備份紀錄，也可在此點選 [Create Backup] 進行手動備份。不論自動或手動備份，都是以 submit 成一個 Work request 型態在 OCI 中運行。手動備份的話就不受限自動備份保存期限的限制，因此需要 DBA 自行維護 (可在頁面中進行刪除不必要的手動備份)。另外注意自動備份是不可以被刪除的，過期的自動備份，OCI 自己會去刪除，若要手動刪除，除非 DBA 殺掉 (Terminate) 這個 DB，才可以去刪除那些自動備份。

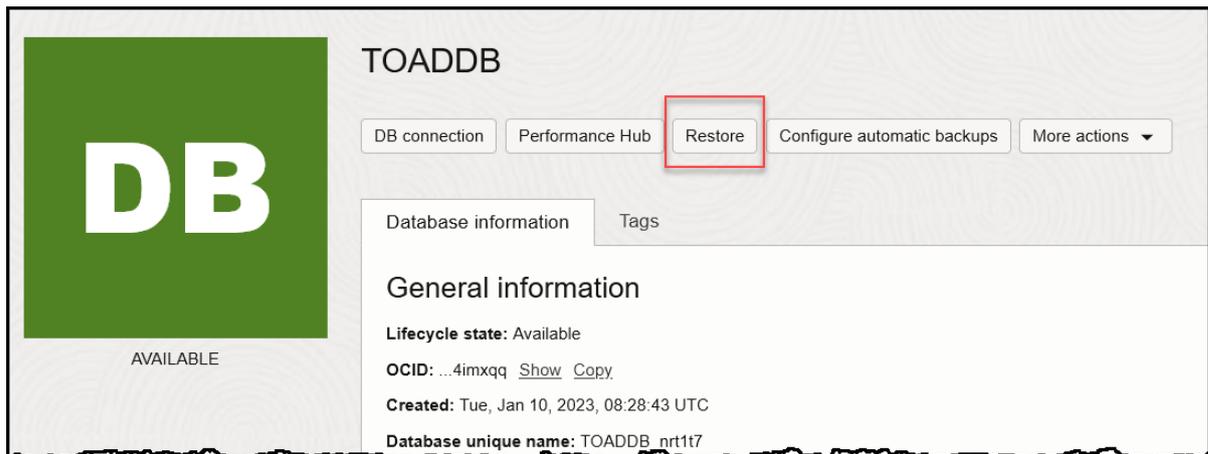
下圖為備份紀錄的樣子 (本例因為有停下這個 DBCS node 一段時日，所以自動備份有出現失敗)。

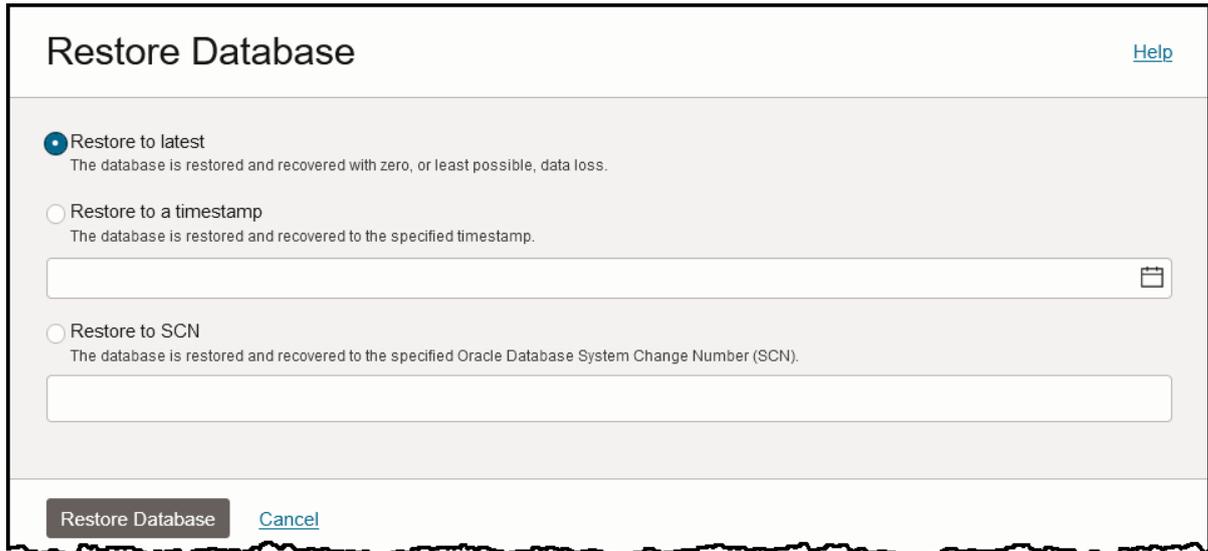
Name	State	Type	Encryption Key	Started	Ended
Automatic Backup	Active	Incremental Backup, Initiated by Auto Backup	Oracle-managed key	Wed, Mar 22, 2023, 21:19:16 UTC	Wed, Mar 22, 2023, 21:30:36 UTC
MyTest01	Active	Incremental Backup, Initiated by Auto Backup	Oracle-managed key	Wed, Mar 22, 2023, 05:34:16 UTC	Wed, Mar 22, 2023, 05:43:35 UTC
Automatic Backup	Active	Incremental Backup, Initiated by Auto Backup	Oracle-managed key	Tue, Mar 21, 2023, 21:19:14 UTC	Tue, Mar 21, 2023, 21:51:32 UTC
Automatic Backup	Failed	Incremental Backup, Initiated by Auto Backup	Oracle-managed key	Mon, Mar 20, 2023, 21:19:11 UTC	Mon, Mar 20, 2023, 21:22:18 UTC
Automatic Backup	Failed	Incremental Backup, Initiated by Auto Backup	Oracle-managed key	Sun, Mar 19, 2023, 21:18:41 UTC	Sun, Mar 19, 2023, 21:22:17 UTC
Automatic Backup	Failed	Incremental Backup, Initiated by Auto Backup	Oracle-managed key	Sat, Mar 18, 2023, 21:23:33 UTC	Sat, Mar 18, 2023, 21:27:31 UTC
Automatic Backup	Failed	Incremental Backup, Initiated by Auto Backup	Oracle-managed key	Fri, Mar 17, 2023, 21:19:33 UTC	Fri, Mar 17, 2023, 21:26:31 UTC
Automatic Backup	Failed	Incremental Backup, Initiated by Auto Backup	Oracle-managed key	Thu, Mar 16, 2023, 21:23:06 UTC	Thu, Mar 16, 2023, 21:36:15 UTC
Automatic Backup	Failed	Incremental Backup, Initiated by Auto Backup	Oracle-managed key	Wed, Mar 15, 2023, 21:18:40 UTC	Wed, Mar 15, 2023, 21:19:37 UTC
Automatic Backup	Active	Incremental Backup, Initiated by Auto Backup	Oracle-managed key	Wed, Mar 1, 2023, 21:24:30 UTC	Wed, Mar 1, 2023, 21:32:43 UTC
Automatic Backup	Active	Incremental Backup, Initiated by Auto Backup	Oracle-managed key	Tue, Feb 28, 2023, 21:19:39 UTC	Tue, Feb 28, 2023, 21:29:35 UTC

若要進行 DB Restore，也可方便的在 DB 明細頁面中，點選 [Restore] 進行。

Restore 可選擇：盡可能回到最近，或回到某個時間點，或是回到某個 SCN。

Restore 的點選處以及 Restore 的選項：

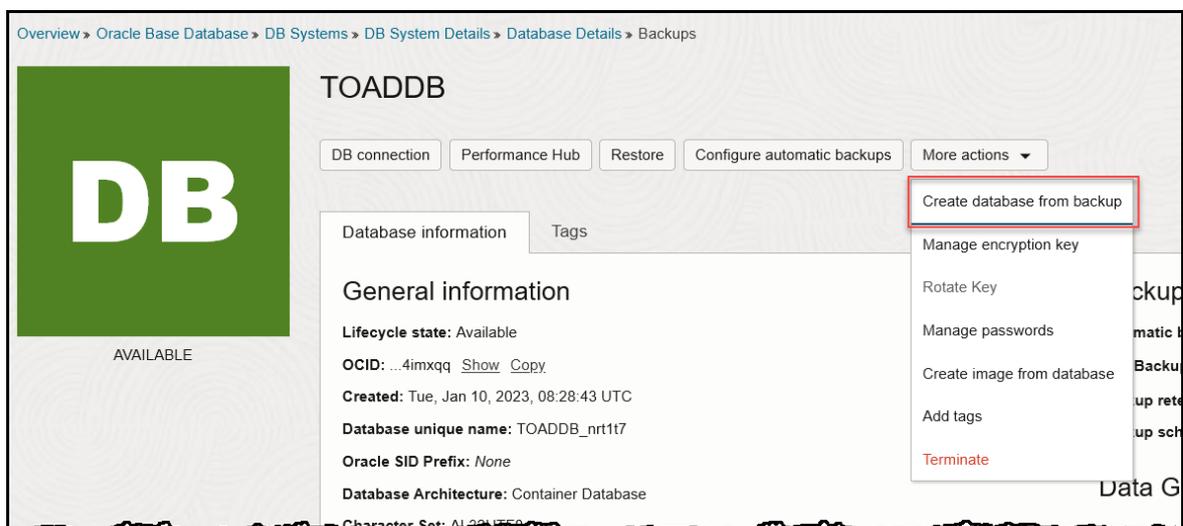




肆、 使用 DBCS 的備份建立另一個 DBCS

OCI 提供很方便的介面，可讓 DBA 快速的使用 DB 的備份建立出另一個 DB，此時可選另外建立出一個 DBCS 出來放這個 DB，或是在既有的 DBCS 中創建 (須注意若您的 DBCS 為 VM 架構，那就只能有一個 DB 在此 VM DBCS 中)。

進行使用備份創建新 DB 的進入點：



下圖為設定要怎樣創建一個新 DB。此處可選擇要使用最近的備份來創建，或是使用指定時間的方式創建一個該時間的 DB。若使用 VM 方式創建的 DBCS，因為有限制這種 DBCS 內只能有一個 DB，所以只可選創建一個新的 DBCS:

The screenshot shows the 'Create database from backup' wizard. It has a 'Help' link in the top right. The main content area is divided into two sections. The first section, 'Select backup timestamp', has two radio buttons: 'Create database from last backup' (unselected) and 'Create database from specified timestamp' (selected). Below this is a 'Restore timestamp' field with an information icon, containing the text 'Mar 21, 2023 20:00 UTC' and a calendar icon. The second section, 'Configure your DB system', has two radio buttons: 'Use an existing DB system' (unselected) and 'Create a new DB system' (selected). At the bottom, there are 'Create' and 'Cancel' buttons.

選擇創建一個新 DBCS 後，開始設定這個新的 DBCS 畫面：

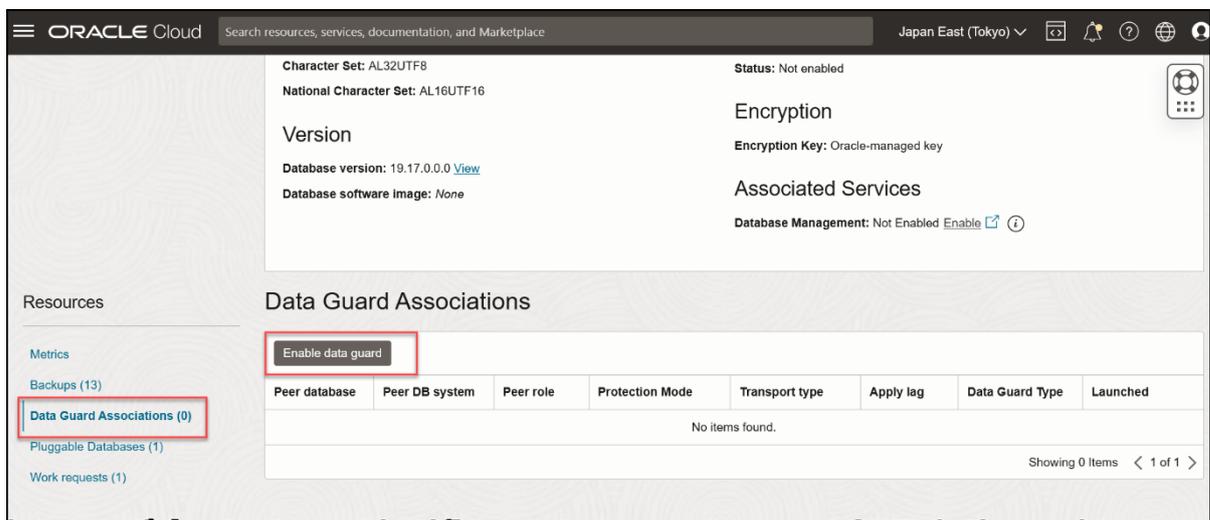
The screenshot shows the 'Create database from backup' wizard at step 2, 'Database information'. A progress indicator on the left shows '1 DB system information' and '2 Database information'. The main content area is titled 'Provide basic information for the DB system'. It includes a 'Select a compartment' dropdown menu with 'Steve' selected, showing the path 'mpinfotest (root)/OSDA/Steve'. Below is a 'Name your DB system' text field containing 'DBSystem-202303231707'. The 'Select a shape type' section has two buttons: 'Virtual Machine' (selected with a checkmark) and 'Bare Metal'. A 'Configure shape' section follows, with a note: 'A shape determines the options for resources such as node count, core count, and storage. For information about shapes, see [Shapes for Virtual Machine DB Systems](#).' Below this is a card for 'AMD VM.Standard.E4.Flex' with details '4 core OCPU, 64 GB memory, 4 Gbps Network Bandwidth, 64K IOPS' and a 'Change shape' button. At the bottom, there is a 'Configure storage' section and 'Next' and 'Cancel' buttons.

之後的步驟雷同創建一個新的 DBCS，在此就不另贅述。

伍、設定 DBCS 的 Data Guard

OCI DBCS 另一個特色是可以直接在雲端建立 Data Guard，為您的 DB 提供更高的可用性。設定 Data Guard 的步驟也不會很難，都可在 OCI 網頁介面中即可完成建置，switchover, failover 等操作。

首先要先啟用 Data Guard Service，在 DB 的明細頁面下方的 Resource 區進入 [Data Guard Associations]。下圖為啟用 Data Guard 的地方：



之後會進行 Peer DB system 的創建：

Enable data guard

1 DB system information A new virtual machine DB system must be created for the standby database when the primary database belongs to a virtual machine DB system.

2 Database information

Create peer DB system

Display name ⓘ
MP0349TOAD-DG

Region
Japan East (Tokyo)
Primary database is in region Japan East (Tokyo)

Availability domain
bufl:AP-TOKYO-1-AD-1
Primary database is in availability domain bufL:AP-TOKYO-1-AD-1

一些必要的相關設定，均在設置頁面逐步設置完成：

Enable data guard

1 DB system information

2 Database information

Data Guard association details

Data Guard Type

Active Data Guard
Active Data Guard is a licensed option to the Oracle Database Enterprise Edition and enables advanced capabilities that extend the basic Data Guard functionality. These capabilities include Real-Time Query and DML Offload, Automatic Block Repair, Standby Block Change Tracking, Far Sync, Global Data Services, and Application Continuity. [Learn more](#)

Data Guard
Oracle Data Guard ensures high availability, data protection, and disaster recovery for enterprise data. Data Guard provides a comprehensive set of services that create, maintain, manage, and monitor one or more standby databases to enable production Oracle databases to survive disasters and data corruptions. Data Guard maintains these standby databases as transactionally consistent copies of the production database. [Learn more](#) ✓

Protection mode
Maximum Performance

Transport type
Async

Enable data guard

1 DB system information Provide information for the initial database

2 Database information

Configure standby database

Database image *Optional*

Click **Change Database Image** to select your software version

Database password

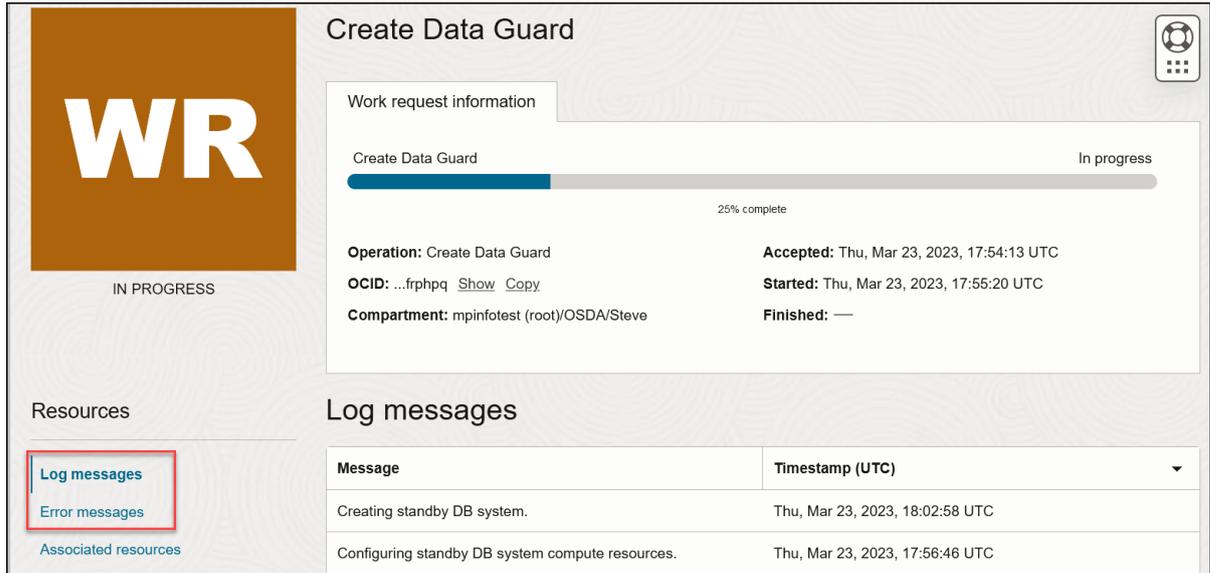
••••••••••

[Show advanced options](#)

Previous **Enable data guard** [Cancel](#)

過程中，可以針對這個 work request 進行檢視：

Resources	Work requests					
	Operation	State	% complete	Accepted	Started	Finished
Databases (1)						
Nodes (1)	Create Data Guard	In progress	0%	Thu, Mar 23, 2023, 17:54:13 UTC	Thu, Mar 23, 2023, 17:55:20 UTC	—
Console connections (0)						



Create Data Guard

Work request information

Create Data Guard In progress

25% complete

Operation: Create Data Guard **Accepted:** Thu, Mar 23, 2023, 17:54:13 UTC
OCID: ...frphpq [Show](#) [Copy](#) **Started:** Thu, Mar 23, 2023, 17:55:20 UTC
Compartment: mpinfotest (root)/OSDA/Steve **Finished:** —

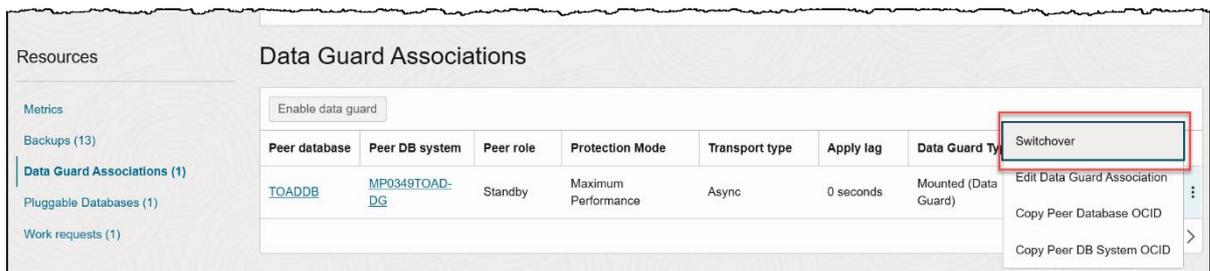
Resources

- Log messages** (highlighted)
- Error messages
- Associated resources

Log messages

Message	Timestamp (UTC)
Creating standby DB system.	Thu, Mar 23, 2023, 18:02:58 UTC
Configuring standby DB system compute resources.	Thu, Mar 23, 2023, 17:56:46 UTC

設置完成後，即可在 OCI 網頁介面上進行操作，例如 Switchover：

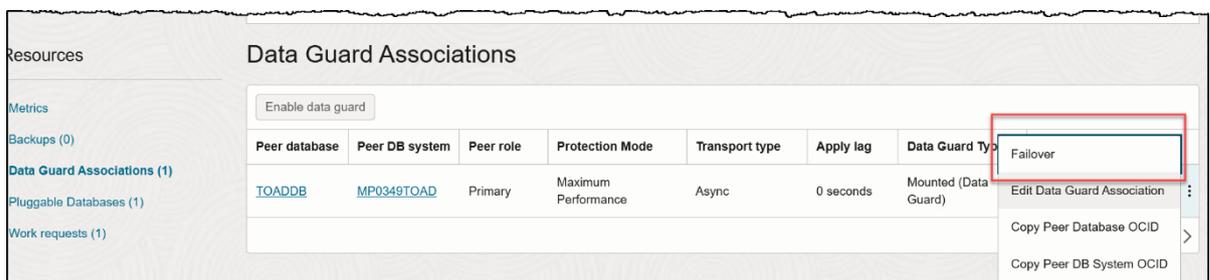


Data Guard Associations

Enable data guard

Peer database	Peer DB system	Peer role	Protection Mode	Transport type	Apply lag	Data Guard Type	Actions
TOADDB	MP0349TOAD-DG	Standby	Maximum Performance	Async	0 seconds	Mounted (Data Guard)	<div style="border: 1px solid red; padding: 2px;">Switchover</div> <ul style="list-style-type: none"> Edit Data Guard Association Copy Peer Database OCID Copy Peer DB System OCID

Failover / Reinststate，均可很方便的在 OCI 網頁介面上完成：



Data Guard Associations

Enable data guard

Peer database	Peer DB system	Peer role	Protection Mode	Transport type	Apply lag	Data Guard Type	Actions
TOADDB	MP0349TOAD	Primary	Maximum Performance	Async	0 seconds	Mounted (Data Guard)	<div style="border: 1px solid red; padding: 2px;">Failover</div> <ul style="list-style-type: none"> Edit Data Guard Association Copy Peer Database OCID Copy Peer DB System OCID

結語

Oracle DBCS 善用了 Oracle Cloud 相關服務，讓我們的雲端 Oracle DB 能有更高的可用度，並獲得更好的照顧，是 OCI 廣受客戶接受與愛用的服務。

若想更深入了解有關 Oracle OCI 雲端資料庫的自動備份、雲端 DataGuard 如何設定、DataGuard switchover 與 failover 等相關內容，歡迎報名倍力資訊於 2023/4/13 舉辦的 [【雲端資料庫不再命懸一線】線上研討會](#)，有效運行雲端災難備援機制，確保企業服務運作的可用性與彈性！