

ORACLE

Autonomous Database Update

Oracle Global Leaders – JAPAC

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DW & Big Data Development

Global Leaders Program

Safe harbor statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, timing, and pricing of any features or functionality described for Oracle's products may change and remains at the sole discretion of Oracle Corporation.

Oracle Database Services on Cloud



Autonomous Database

- Shared Infrastructure
- Dedicated Infrastructure



Database Cloud Service

- VM
- Bare Metal



Exadata Cloud Service



Exadata Cloud at Customer

Oracle Spent Last 20 Years Automating Database Technology

- Automatic Indexes
- SQL Quarantine
- Real-Time Statistics

19c

- Autonomous Health Framework
- Automatic Diagnostic Framework
- Automatic Refresh of Clones

18c

- Automatic Columnar Flash
- Automatic IM population
- Automatic Application Continuity

12c

- Automatic Memory Management
- Automatic Segment Space Mgmt
- Automatic Statistics Gathering
- Automatic Storage Management
- Automatic Workload Repository
- Automatic Diagnostic Monitor

11g

- Automatic SQL Tuning
- Automatic Workload Capture/Replay
- Automatic SQL Plan Management
- Automatic Capture of SQL Monitor
- Automatic Data Optimization

- Automatic Query Rewrite
- Automatic Undo Management

10g

9i



Oracle Spent Last 10 Years Automating Database Infrastructure

2008

- Smart Scan
- Infiniband Scale-Out
- Database Aware Flash Cache
- Storage Indexes
- Hybrid Columnar Data

- IO Priorities
- Data Mining Offload
- Offload Decryption

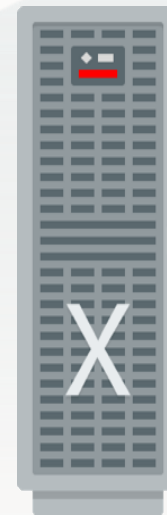
- Network Resource Mgmt
- Prioritized File Recovery

- Direct-to-wire Protocol
- JSON and XML offload
- Instant failure detection

- In-Memory Columnar in Flash
- Smart Fusion Block Transfer

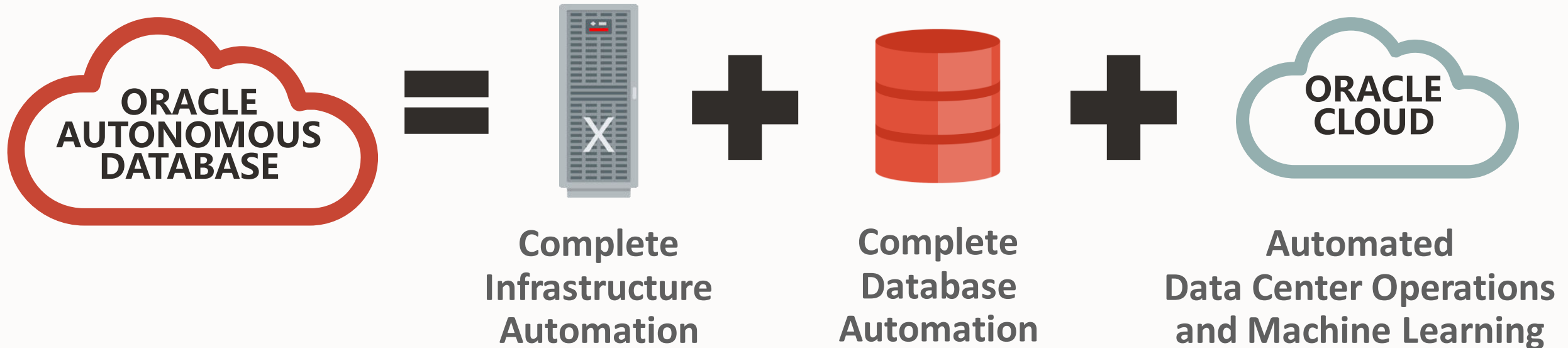
- Exadata Cloud Service

2019

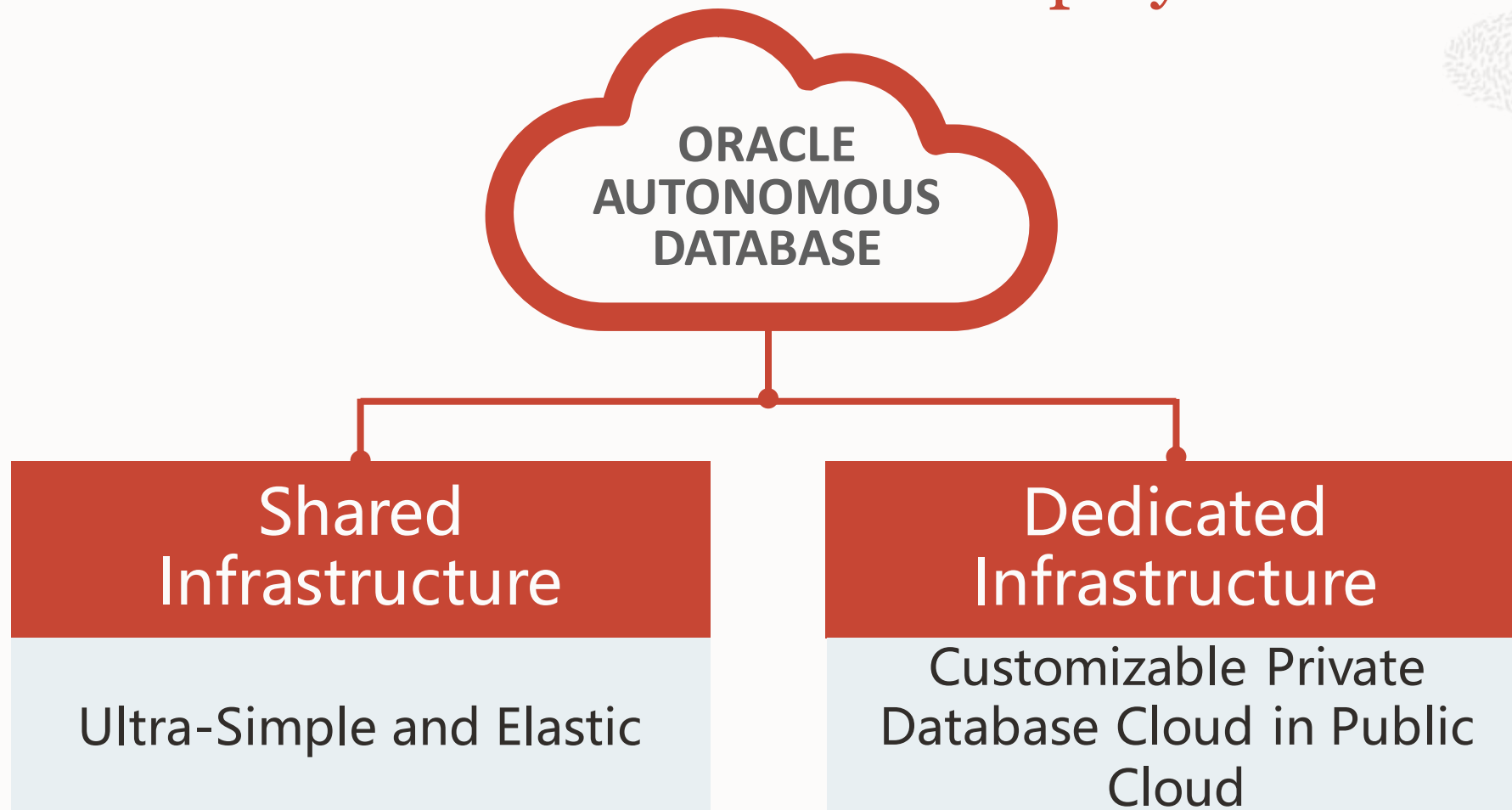


Autonomous Database Completes the Job

Eliminates All the Complexity of Mission Critical Databases



One Autonomous Database – Two Deployment Choices



Autonomous Database - *Optimized by Workload*



Autonomous Data Warehouse

Data Warehouse,
Data Mart, Data Lake

Autonomous Transaction Processing

Transactions,
Batch, Reporting

Autonomous JSON Database

Fast, Easy, Low-Cost
JSON Data

New

APEX Application Development Service

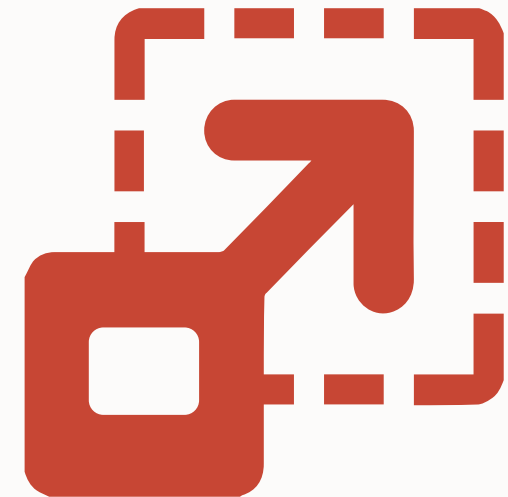
Fast, Easy, Low-Cost
Low-Code AppDev

Coming soon

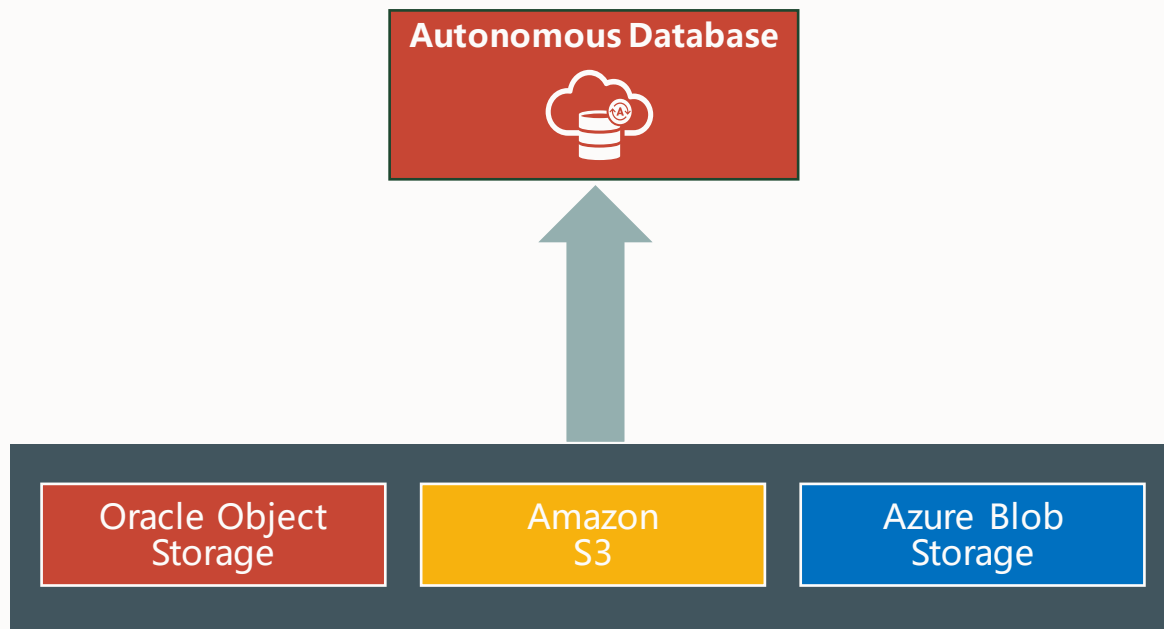


Fully Elastic: Pay for What you Use

- Size to the exact number of OCPU's and TB's required
 - Not constrained by fixed building blocks
- **Auto-Scaling** instantaneously adjusts CPU and IO resources for current workload requirements
 - Up to 3x CPU and IO resources
 - Simple 1-click to enable
- Shut off idle compute save money
 - Restart instantly



Queries Over Object Stores



- Autonomous Database supports SQL queries and data loading from Object Stores
 - Data-processing occurs using ADB OCPU's
 - **Any supported Oracle-loader file format**
 - Optimized support for **Parquet and Avro** files
- Seamless queries across object store and database
- DBMS_CLOUD package provided
 - Create External Table
 - Copy Data from Object Store to DB
- Support partitioning over Object Store
 - Partitioned External Tables
 - Hybrid Partitioned Tables

Optimization

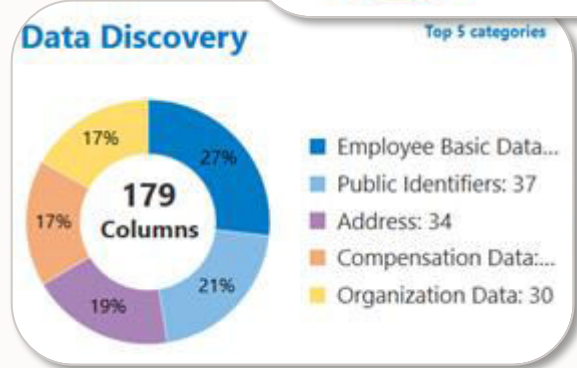
- **Workload Optimization**
 - Optimized & Configured for specific Workload
- **Automatic System & Storage Optimization**
 - SGA & PGA
 - Online Redo Logs placement
 - Database File placement
- **Automatic Schema Level Optimization**
 - Automatic Optimizer Statistics
 - Automatic Indexing
 - Automatic SQL Plan Management & Many more to come

Oracle Data Safe

Autonomous Database | **Now even more Secure**

- One-Click Configuration
- Unified Database Security Control Center
 - Security Configuration Assessment
 - User Risk Assessment
 - User Activity Auditing
 - Sensitive Data Discovery
 - Data Masking
- Saves time and mitigates security risks
- Defense in Depth for all customers
- No special security expertise needed

Data Safe ⓘ
Status: Not registered [Register](#)



Available with Oracle Cloud Databases at no additional cost



Recent Updates on Autonomous Database

Autonomous Database: Recent New Features

MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
Private Endpoints	Stateful Rule Support in PE	Service Level Agreement	Customer Managed ORDS	Autonomous Data Guard	Autonomous JSON Database	Refreshable Clones	ADG for Autonomous JSON
APEX 19.2 (New 19c Instances)	Per-second billing	19c One-Click Upgrade	SQL access to tenancy details	Database Gateways	Database Rename	Database Modes	Private Endpoint Support for Tools
Database Restart	Extensions for IDEs	SODA Support	Support for ORC files and complex data types	Modify Network Configuration	Data Safe Support for ADBs on PE	SQL Macros	OCI Events Enhancements
Data Pump Direct Export to Object Store	Data Pump access driver for external tables	Performance Hub – new metrics	AWR Reports on Performance Hub	APEX 20.1			OCI PL/SQL SDK
Data Pump Pre-authenticated URLs for Dump Files	Data Pump access driver for data loading	OCI Metrics Service – new metrics	Transfer limits for Object Store increased	Improved Time Zone Support			
Manual Upgrade Options for 19c	Wallet Enhancements		Procedures for Using Database RAS	Modify User Profiles			
				Pre-Built DW Stacks in Resource Manager			



NEW IN
19^C

Autonomous Data Guard



Autonomous Data Guard

NEW IN
19c

- Hidden standby (peer) database
 - Located in a different Availability Domain
- One-click configuration
- No management required
- One-click switchover
- Automatic failover
 - Transparent to applications

- Available for Autonomous JSON databases too

Database for GLP APAC

DB Connection Performance Hub Service Console Scale Up/Down More Actions

Autonomous Database Information Tools Tags

ADW
AVAILABLE

General Information

Database Name: GLPAPAC
Workload Type: Data Warehouse
Compartment: adw4pm (root)/Coles_Compartment
OCID: ...6gm5ea [Show](#) [Copy](#)
Created: Wed, Nov 25, 2020, 10:58:19 UTC
OCPU Count: 1
Storage: 1 TB
License Type: Bring Your Own License (BYOL)
Database Version: 19c
Auto Scaling: Enabled ⓘ
Lifecycle State: Available
Instance Type: Paid
Mode: Read/Write [Edit](#)

Infrastructure

Dedicated Infrastructure: No

Autonomous Data Guard ⓘ

Status: Enabled [Disable](#)
Peer State: Available [Switchover](#)

Backup

Last Automatic Backup: No active backups exist for this database.
Manual Backup Store: Not Configured

Network

Access Type: Allow secure access from everywhere
Access Control List: Disabled [Edit](#)

Maintenance ⓘ

Next Maintenance: Sat, Nov 28, 2020, 04:00:00 UTC - 08:00:00 UTC

Data Safe ⓘ

Status: Not Registered [Register](#)

Operations Insights ⓘ

Status: Not Enabled [Enable](#)

Create Autonomous Database

Display Name	State	Dedicated	OCPUs	Storage (TB)	Workload Type	Autonomous Data Guard	Created
Database for GLP APAC	Available	No	1	1	Data Warehouse	Enabled	Wed, Nov 25, 2020, 10:58:19 UTC

Displaying 1 Autonomous Database < 1 of 1 >



Database for GLP APAC

- DB Connection
- Performance Hub
- Service Console
- Scale Up/Down
- More Actions

- Autonomous Database Information
- Tools
- Tags

General Information

Database Name: GLPAPAC
Workload Type: Data Warehouse
Compartment: adwc4pm (root)/Coles_Compartment
OCID: ...6qm5ea [Show](#) [Copy](#)
Created: Wed, Nov 25, 2020, 10:58:19 UTC
OCPU Count: 1
Storage: 1 TB
License Type: Bring Your Own License (BYOL)
Database Version: 19c
Auto Scaling: Enabled ⓘ
Lifecycle State: Available
Instance Type: Paid
Mode: Read/Write [Edit](#)

Operations Insights ⓘ

Status: Not Enabled [Enable](#)

Infrastructure

Dedicated Infrastructure: No

Autonomous Data Guard ⓘ

Status: Disabled [Enable](#)

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Database for GLP A

DB Connection Performance Hu

Autonomous Database Inform

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Lifecycle State: Available
Instance Type: Paid
Mode: Read/Write [Edit](#)

Operations Insights ⓘ

Status: Not Enabled [Enable](#)

Enable Autonomous Data Guard

[Help](#) [Cancel](#)

Enabling Autonomous Data Guard creates a standby database and incurs additional service costs. Do you want to enable Autonomous Data Guard?

Enable Autonomous Data Guard

Cancel

Infrastructure

Dedicated Infrastructure: No

Autonomous Data Guard ⓘ

Status: Disabled [Enable](#)

Backup

Last Automatic Backup: No active backups exist for this database.

Manual Backup Store: Not Configured

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Maintenance ⓘ

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Status: Not Registered [Register](#)





Database for GLP APAC

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- Tools
- Tags

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Created: Wed, Nov 25, 2020, 10:58:19 UTC
OCPU Count: 1
Storage: 1 TB
License Type: Bring Your Own License (BYOL)
Database Version: 19c
Auto Scaling: Enabled ⓘ
Lifecycle State: Updating
Instance Type: Paid
Mode: Read/Write [Edit](#)

Operations Insights ⓘ

Status: Not Enabled [Enable](#)

Infrastructure

Dedicated Infrastructure: No

Autonomous Data Guard ⓘ

Status: Disabled [Enable](#)
Peer State: ● Provisioning [Switchover](#)

Backup

Last Automatic Backup: No active backups exist for this database.
Manual Backup Store: Not Configured

Network

Access Type: Allow secure access from everywhere
Access Control List: Disabled [Edit](#)

Maintenance ⓘ

Next Maintenance: Sat, Nov 28, 2020, 04:00:00 UTC - 08:00:00 UTC

Data Safe ⓘ

Status: Not Registered [Register](#)





AVAILABLE

Database for GLP APAC

DB Connection

Performance Hub

[Service Console](#)

Scale Up/Down

More Actions ▾

Autonomous Database Information

Tools

Tags

General Information

Database Name: GLPAPAC

Workload Type: Data Warehouse

Compartment: adwc4pm (root)/Coles_Compartment

OCID: ...6qm5ea [Show](#) [Copy](#)

Created: Wed, Nov 25, 2020, 10:58:19 UTC

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Storage: 1 TB

License Type: Bring Your Own License (BYOL)

Database Version: 19c

Auto Scaling: Enabled ⓘ

Lifecycle State: Available

Instance Type: Paid

Mode: Read/Write [Edit](#)

Operations Insights ⓘ

Status: Not Enabled [Enable](#)

Infrastructure

Dedicated Infrastructure: No

Autonomous Data Guard ⓘ

Status: Enabled [Disable](#)

Peer State: ● Available [Switchover](#)

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Maintenance ⓘ

Next Maintenance: Sat, Nov 28, 2020, 04:00:00 UTC - 08:00:00 UTC

Data Safe ⓘ

Status: Not Registered [Register](#)



Database for GLP APAC

DB Connection

Performance Hub



Autonomous Database Information

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Compartment: adwc4pm (root)/Coles_Compartment

OCID: ...6qm5ea [Show](#) [Copy](#)

Created: Wed, Nov 25, 2020, 10:58:19 UTC

OCPU Count: 1

Storage: 1 TB

License Type: Bring Your Own License (BYOL)

Database Version: 19c

Auto Scaling: Enabled ⓘ

Lifecycle State: Available

Instance Type: Paid

Mode: Read/Write [Edit](#)

Operations Insights ⓘ

Status: Not Enabled [Enable](#)

Confirm Manual Switchover to Standby

[Help](#) [Cancel](#)

Do you want to switch over the database **GLPAPAC** now?

Confirm the switchover to the standby database by entering the database name

GLPAPAC|

Confirm Manual Switchover to Standby

Cancel

Autonomous Data Guard ⓘ

Status: Enabled [Disable](#)

Peer State: ● Available ⓘ [Switchover](#)

Backup

Last Automatic Backup: Mon, Nov 30, 2020, 21:21:27 UTC

Manual Backup Store: Not Configured

Network

Access Type: Allow secure access from everywhere

Access Control List: Disabled [Edit](#)

Maintenance ⓘ

Next Maintenance: Sat, Dec 5, 2020, 04:00:00 UTC - 08:00:00 UTC

Data Safe ⓘ

Status: Not Registered [Register](#)



ADW

UPDATING

Database for GLP APAC

DB Connection Performance Hub [Service Console](#) [Scale Up/Down](#) [More Actions](#) ▾

Autonomous Database Information Tools Tags

General Information

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Workload Type: Data Warehouse
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Lifecycle State: Updating
Instance Type: Paid
Mode: Read/Write [Edit](#)

Operations Insights ⓘ

Status: Not Enabled [Enable](#)

Infrastructure

Dedicated Infrastructure: No

Autonomous Data Guard ⓘ

Status: Enabled [Disable](#)

Peer State: ● Role Change In Progress [Switchover](#)

Backup

Last Automatic Backup: Wed, Nov 25, 2020, 12:42:50 UTC

Manual Backup Store: Not Configured

Network

Access Type: Allow secure access from everywhere

Access Control List: Disabled [Edit](#)

Maintenance ⓘ

Next Maintenance: Sat, Nov 28, 2020, 04:00:00 UTC - 08:00:00 UTC

Data Safe ⓘ

Status: Not Registered [Register](#)



Database for GLP APAC

DB Connection Performance Hub [Service Console](#) Scale Up/Down More Actions ▾

Autonomous Database Information Tools Tags

General Information

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Workload Type: Data Warehouse
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Auto Scaling: Enabled ⓘ
Lifecycle State: Available
Instance Type: Paid
Mode: Read/Write [Edit](#)

Operations Insights ⓘ

Status: Not Enabled [Enable](#)

Infrastructure

Dedicated Infrastructure: No

Autonomous Data Guard ⓘ

Status: Enabled [Disable](#)
Peer State: ● Provisioning [Switchover](#)

Backup

Last Automatic Backup: Wed, Nov 25, 2020, 12:42:50 UTC
Manual Backup Store: Not Configured

Network

Access Type: Allow secure access from everywhere
Access Control List: Disabled [Edit](#)

Maintenance ⓘ

Next Maintenance: Sat, Nov 28, 2020, 04:00:00 UTC - 08:00:00 UTC

Data Safe ⓘ

Status: Not Registered [Register](#)

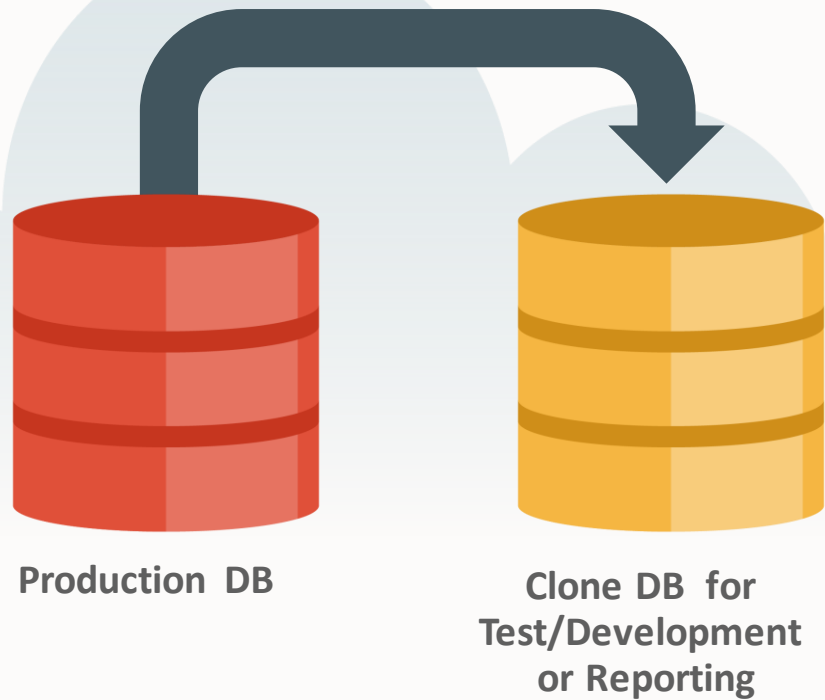


NEW IN
19^C

Refreshable Clones

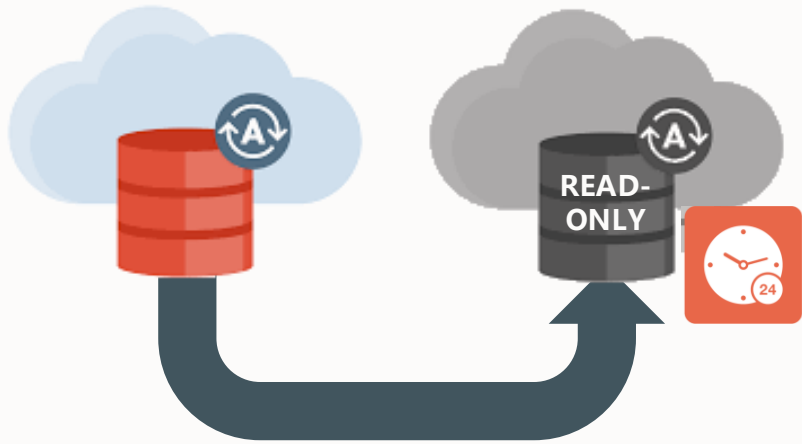







Cloning in Autonomous Database



- Easy and fast cloning
- Options:
 - Full clone
 - Metadata-only clone
 - Clone from backup
 - Choose a specific backup
 - Choose point-in-time
- **NEW:**
 - Refreshable clones

Refreshable Clones



-  **Simple** – Easy to create through OCI console and/or scripting
-  **Scalable** – Each clone can scale its own CPU resources as usage grows
-  **Grow** – No limit to number of refreshable clones associated with a source
-  **Manage costs** – Bill different units separately based on their usage of one or more refreshable clones
-  **Secure** – Automatically inherits data security features from source instance, such as data masking, with option of additional control over network settings (ACLs , VCNs etc)

OCI Events Service Integration

OCI Events Integration – Autonomous Databases

- ADB users can
 - Use OCI Events to subscribe to and be notified of Autonomous Database events
 - Create automation and receive notifications based on state changes for ADB

New enhancements now enable users to subscribe to the following categories of events for Autonomous Database:

- Critical Events
 - Database instance down and up
- Information Events
 - Maintenance tasks starting/finishing, maintenance window changes
- Individual Events

Topics in Coles_Compartment *Compartment*

- Topics
- Subscriptions**

List Scope

Compartment

Coles_Compartment
adwc4pm (root)/Coles_Compartment

[Create Topic](#)

Name	Description	State	Topic OCID	Created
MyADBNotification	This is my ADB Notification	● Active	...knqynlyasa Show Copy	Wed, Dec 2, 2020, 06:37:10 UTC

Showing 1 Item < Page 1 >

Subscriptions in Coles_Compartment

[Create Subscription](#)

Topic Name

Topic Name

Create Subscription [Help](#)

[Create Subscription](#)

Topic: MyADBNotification

Protocol: Email

Email:

Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values that can be attached to resources.

[Learn more about tagging](#)

Tag Namespace	Tag Key	Value
None (add a free-form tag)	<input type="text"/>	<input type="text"/>

[+ Additional Tag](#)

[Create](#) [Cancel](#)



Create Rule

Display Name
My ADB Rule

Description
This is my Rule for the ADB Instances in my Compartment

Rule Conditions

Limit the events that trigger actions by defining conditions based on event types, attributes, and filter tags. [Learn more](#)

Condition : Service Name : Event Type

Event Type : Database

Autonomous Data Guard Association - Switchover Begin x

Autonomous Database - Restart Begin x

Autonomous Database - Start Begin x

Autonomous Database - Stop Begin x

+ Another Condition

Rule Logic

```
MATCH event WHERE (
  eventType EQUALS ANY OF (
    com.oraclecloud.databaseservice.restartautonomou
sdatabase.begin,
    com.oraclecloud.databaseservice.startautonomou
sdatabase.begin,
    com.oraclecloud.databaseservice.stopautonomou
sdatabase.begin,
    com.oraclecloud.databaseservice.switchoverautono
mousdataguardassociation.begin
  )
)
```

[View example events \(JSON\)](#)

Validate Rule

Actions

Actions trigger for the specified event conditions. [Learn more](#).

Action Type : Notifications Compartment : Topic

Notifications : Coles_Compartment : MyADBNotification

+ Another Action

[Advanced options](#)

Create Rule Cancel



Database for GLP APAC

DB Connection

Performance Hub

Service Console

Scale Up/Down

More Actions

Autonomous Database Information

Tools

Tags

Stop

Restart

Restore

Create Clone

General Information

Database Name: GLPAPAC

Workload Type: Data Warehouse

OCI Event Notification :com.oraclecloud.databaseservice.restartautonomousdatabase.begin



noreply@notification.ap-mumbai-1.oci.oraclecloud.com

Today at 2:53 PM

To: vivek.s.sharma@oracle.com

```
{ "eventType": "com.oraclecloud.databaseservice.restartautonomousdatabase.begin", "cloudEventsVersion": "0.1", "eventTypeVersion": "2.0", "source": "DatabaseService", "eventTime": "2020-12-02T09:22:42Z", "contentType": "application/json", "data": { "compartmentId": "ocid1.compartment.oc1..aaaaaaaagmxvc2h3zmnxbfkiypqyna77odo2tws77leteo27xdoffeyjsma", "compartmentName": "Coles_Compartment", "resourceName": "Database for GLP APAC", "resourceId": "ocid1.autonomousdatabase.oc1.ap-mumbai-1.abrg6ljreoxv3ga3yyf3w3v6poxigdorq4jp3ry56dpkl4majuzf676qm5ea", "availabilityDomain": "", "freeformTags": {}, "definedTags": {}, "additionalDetails": { "cpuCoreCount": 1, "dataStorageSizeInTBs": 1, "lifecycleState": "RESTARTING", "timeCreated": "2020-11-25T10:58:19Z", "timeUpdated": "2020-12-02T09:22:42Z", "dbName": "GLPAPAC", "licenseType": "BRING_YOUR_OWN_LICENSE", "serviceConsoleUrl": "https://adb.ap-mumbai-1.oraclecloud.com/console/index.html?tenant_name=OCID1.TENANCY.OC1..AAAAAAAFCU567Z0WRF4XVGN5F6BGMKCV5B7XWQYBIC9QGF32EWNRCV12A&database_name=GLPAPAC&service_type=ADW", "workloadType": "Data Warehouse", "autonomousDatabaseType": "Shared Infrastructure", "autonomousDatabaseId": "ocid1.autonomousdatabase.oc1.ap-mumbai-1.abrg6ljreoxv3ga3yyf3w3v6poxigdorq4jp3ry56dpkl4majuzf676qm5ea" }, "eventID": "34cce546-ff36-4dcc-bd53-598e88ffc429", "extensions": { "compartmentId": "ocid1.compartment.oc1..aaaaaaaagmxvc2h3zmnxbfkiypqyna77odo2tws77leteo27xdoffeyjsma" } }
```

--

You are receiving notifications as a subscriber to the topic: MyADBNofication (Topic OCID: ocid1.onstopic.oc1.ap-mumbai-1.aaaaaaa3kgwntidoqgwlc73wdmkpf4jvt4jjcpwc5awqip4knqnylyasa). To stop receiving notifications from this topic, [unsubscribe](#).

Please do not reply directly to this email. If you have any questions or comments regarding this email, contact your account administrator.



Coming Soon...

Autonomous Database: **New Features Coming...**

**Autonomous
Data Platform**

**Character Set
Change Support**

**OML Python
Support**

**Cross Region
Clone & ADG**

**SYSDATE in
DB Timezone**

Auto ML

**ADB as a Source
for Golden Gate**

**Customer
Managed Keys**

**Walletless
Connection with
Private Endpoint**

Thank you



Vivek Sharma

vivek.s.sharma@oracle.com

DW & Big Data Development

Global Leaders Program

