

Oracle Autonomous AI Database Service Professional Workshop

Table of Contents

Getting Started with Autonomous AI Database

- Objectives
- Oracle Autonomous AI Database
- Complete Database Automation
- Not an Incremental Improvement
- Autonomous AI Database Is Highly Available
- Oracle Autonomous AI Database
- Describing the key features of Autonomous AI Database
- Oracle Autonomous AI Database What and How
- Summary

Offerings

- Objectives
- Autonomous AI Database Revolutionizes Data Management
- Oracle Has Spent the Last 20 Years Automating Database Technology
- Oracle Has Spent the Last 10+ Years Automating Database Infrastructure
- One Autonomous AI Database
- Autonomous AI Lakehouse Characteristics
- Autonomous AI Lakehouse Benefits
- One Autonomous AI Database Two Deployment Choices
- Simple Fully automated Elastic
- Summary

Licensing

- Objectives
- ECPU Pricing Metric
- ECPU Key Points
- Autonomous AI Database Licensing: Lakehouse and ATP
- Oracle Universal Credit Payment Structures
- Autonomous AI Database Licensing
- Summary

Database Consolidation with Elastic Pools

- Objectives
- Oracle Autonomous AI Database
- Elastic Resource Pools

About Elastic Pools

Lower Costs with Elastic Pools

How does billing work?

Creating a Resource Pool

Joining an Existing Resource Pool

Summary

Introduction

Objectives

Complete Cloud Infrastructure Platform

Cloud Regions, Hybrid Cloud, Multicloud

Powerful Core Infrastructure Services

Comprehensive Database Services

Broad Data Management and Data Science Capabilities

Manage, Secure, and Operate at Scale

Build and Run Cloud Native Applications and Extend Existing Apps

Robust Oracle Analytics and Third-Party Support

Comprehensive Horizontal and Industry SaaS Portfolio

Complete Cloud Infrastructure Platform

Service Limits and Compartment Quotas

Compartments

Compartment Quotas

Compartment Quotas for Autonomous DB

Compartment Quotas

Summary

Create an Autonomous AI Database

Objectives

Creating the Database

Creating an Autonomous AI Database

Summary

Starting, Stopping, and Auto Scaling

Objectives

Autonomous AI Database: Starting, Stopping, and Auto-Scheduling

Starting an Autonomous AI Database

Stopping an Autonomous AI Database

Auto Start/Stop Schedule for Autonomous AI Database

Autonomous AI Database Serverless: Auto Scaling

Auto Scaling

Setting Up Auto Scaling: Any Time

Summary

Backup and Recovery

Objectives

Automatic backup

Backups Available for Recovery

Restoring and Recovering Your Autonomous AI Database

Immutable Backups

Long-Term Backups

Autonomous AI Database Long-Term Backups

Summary

Data Guard and Disaster Recovery

Objectives

Fully Automated Data Protection

Fully Automated Protection That Supports Different SLAs

Autonomous Data Guard Policy

Autonomous Data Guard

Enabling Autonomous Data Guard

Performing a Manual Switchover

Automatic and Manual Failover Options

Enabling Autonomous Data Guard

Autonomous Data Guard: List of Paired Regions

Summary

Dedicated Infrastructure

Objectives

One Autonomous AI Database Two Deployment Choices

Autonomous AI Database Dedicated: Primary Benefits

Fully-Elastic Scale-Out Dedicated Infrastructure Configurations

Autonomous AI Database Dedicated Stack

Autonomous Management Model

Dedicated Network Architecture

Exadata Cloud@Customer addresses these concerns.

Autonomous AI Database: Cloud@Customer Primary Benefits

Lightweight Local Cloud Control Plane Servers

ADB-C@C Gen 2 Network Connectivity

Simple Connectivity to the Data Center Network
ADB on ExaC@C: Resilience to Disrupted OCI Connectivity
ADB on ExaC@C: Database Backup Options
Autonomous AI Database Dedicated: Primary Benefits
Summary

Dedicated Infrastructure

Objectives
Autonomous AI Database Dedicated: Private Database Cloud
Autonomous AI Database Dedicated: Exadata Infrastructure
Autonomous AI Database Dedicated
Autonomous AI Database Dedicated: General Selection Considerations
Autonomous AI Database Feature Comparison
Summary

Creating OCI Policies for Autonomous AI Database Dedicated

Objectives
Dedicated: Roles
Dedicated: Fleet Administrators
Dedicated: Developers and DBAs
Service Lifecycle
ADB Dedicated Fleet and DB Admin IAM Setup
ADB Dedicated Configuration Example
ADB Dedicated Fleet and DB Admin Policy Example
Summary

Provisioning Dedicated Resources

Objectives
Setting Up an Autonomous AI Database: Dedicated Infrastructure
Prerequisite: Networking
Setting Up an Autonomous AI Database: Dedicated Infrastructure
Provisioning an Exadata Infrastructure
Setting Up an Autonomous AI Database: Dedicated Infrastructure
Provisioning an Autonomous VM Cluster
Setting Up an Autonomous AI Database: Dedicated Infrastructure
Provisioning an Autonomous Container Database
Setting Up an Autonomous AI Database: Dedicated Infrastructure
Provisioning a Dedicated Autonomous AI Database
Summary

Dedicated Infrastructure

- Objectives
- Autonomous AI Database: Dedicated
- ADB- Dedicated Update Policy
- Full Control of Software Versions and ADB Placement
- Autonomous Dedicated Maintenance Scheduling and Preferences
- ADB-Dedicated Update Policy
- ADB-Dedicated Service Maintenance
- One-Off Patching: Unscheduled Maintenance
- Monitor Service Maintenance Events
- Maintenance History
- Summary

Monitoring Dedicated Infrastructure

- Objectives
- Autonomous AI Database Management Capabilities
- ADB-Dedicated: Database Operations Available on Cloud Control Plane
- ADB-Dedicated: OCI Metrics, Dynamic Performance Views, Resource Logs
- ADB-Dedicated: Additional Service Monitoring
- ADB-Dedicated: Monitor Activities Using Events and Notifications
- Summary

Monitoring Autonomous AI Database Performance

- Objectives
- Monitoring Performance from the Cloud Console
- Metrics
- Monitoring Performance from the Cloud Console
- Performance Hub
- Auto-Index Creation Is Inherently Better
- Continuous Optimization: Using Machine Learning
- Automatic Indexing
- Configuring and Monitoring Automatic Indexes
- Summary

Creating Alarms, Events, and Notifications

- Objectives
- Events and Notifications
- Defining an Event
- Creating a Topic

- Creating a Subscription for the Notification
- Creating an Alarm (CPU Utilization)
- Notifications
- Setting Up Announcement Notifications
- Configure Announcement Subscriptions
- Summary

Using OCI CLI to Manage ADB

- Objectives
- Autonomous AI Database: Using OCI-CLI
- Autonomous AI Database: Using OCI-CLI Requirements
- Autonomous AI Database: OCI CLI
- Autonomous AI Database: Using OCI-CLI Supported Services
- Autonomous AI Database: OCI CLI – Examples
- Autonomous AI Database: REST APIs
- Summary

Cloning and Moving Databases

- Objectives
- Autonomous AI Database Cloning
- Refreshable Clones Key Points to Consider
- Change Workload Type When Creating a Clone
- Moving Autonomous AI Database Resources
- Summary

Setting Up Network and Encryption Keys

- Objectives
- Securing Application Connections with ACLs
- Setting Up an ACL
- Private Endpoints
- Setting Up Private Endpoints with ADB
- Network Security Group
- Data Encryption and Key Management
- End-to-End Data Protection
- Summary

Manage Users and Security

- Objectives
- Industry-Leading Data Security End-to-End Data Security; Always Enabled; No Extra Costs
- OCI Identity and Access Model for Fine-Grained Service Access

- Simplified Database User Management
 - Simple User Management via Database Actions
 - Simplified Database User Management: Oracle Data Safe
 - Oracle Data Safe
 - Database Security Assessment
 - Detecting Configuration Drift
 - Detecting User and Entitlement Drift
 - Activity Auditing
 - Sensitive Data Discovery
 - Sensitive Data Masking
 - SQL Firewall Management in Oracle Data Safe
 - SQL Firewall
 - Oracle Data Safe
 - Summary

Connecting to an Autonomous AI Database

- Objectives
- Autonomous AI Database Connectivity Options
- Autonomous AI Database Credentials
- Downloading Autonomous AI Database Credentials
- Connecting to Autonomous AI Database: Wallets
- Wallet vs. Walletless Connections
- Predefined Database Service Names
- Summary

Connection Examples

- Objectives
- Autonomous AI Database Wallet and Connection Strings
- Using SQLNet Connections
- Python, Node.js, and Other Scripting Languages
- Connect to ADB Using SQL Developer
- Connect to ADB Using Built-In Database Actions
- User Management UI: Granting Access to Database Actions
- Command-Line Workflow for Granting Access to Database Actions
- Connecting .NET Applications
- Connecting JDBC Thin or Universal Connection Pool
- JDBC Thin URL
- JDBC Thin Connections with an HTTP Proxy

Connecting to ADB Using JDBC
Two Helper Connection Samples
Summary

Oracle Autonomous AI Database Tools

Objectives
Oracle Autonomous AI Database
Database Actions
Autonomous as a Development Environment
SQL Developer
APEX
REST
JSON
SQLcl
Data Studio
Overview of Data Studio Tools
Database Actions
Machine Learning Notebooks
Database Actions
Graph Studio
Summary

Autonomous AI Database Data Studio

Objectives
Data Studio
Enabling Data Studio
Catalog: Search and Discover Data
Catalog: Understand Data
Catalog: Trace Data Lineage and Impact
Data Load: Easy-to-Use Load, Link, and Feed
Table AI Assist: Guided Data Preparation
Data Transforms: Comprehensive E-L-T
Jobs: Operationalize Data Load and Preparation
Insights: Automate the Discovery of Data Insights
Analysis: Model, Query, and Analyze Your Data
Analysis: Spreadsheet Add-Ins
Share: Govern Access to Shared Data
Marketplace

Summary

Data Sharing with Autonomous AI Database

Agenda

Data sharing is the process to make data available to one or many recipients to use.

Traditional Methods of Data Sharing Are Complex and Insecure

Modern Data Sharing is the process to make data available centrally and securely to one or many recipients to use without the need to duplicate data.

New Business Opportunities with Data Sharing

Modern Data Sharing

Data Sharing with Autonomous AI Databases

Summary: Data Sharing in Autonomous AI Database

Summary

APEX

Objectives

APEX Integrated into Autonomous AI Database

APEX: Rapid Schema Design with Quick SQL

Creating New Apps with APEX Easy As 1-2-3

APEX: Take Advantage of Sample Apps

Summary

Autonomous AI Database with Oracle Machine Learning

Objectives

What is Machine Learning?

Machine Learning Techniques

Introduction to AutoML

AutoML in OML4Py

The OML AutoML UI Pipeline

Algorithm Selection

Feature Selection

Model Tuning

Summary

Natural Language Queries Just Ask Your Database

Objectives

Oracle can bring AI to the enterprise at every layer of our stack.

Autonomous AI Database Select AI

Select AI

Demonstration

Chat with your data

Select AI

Select AI Translates Your Language into Oracle SQL Language

Developing Apps with Select AI

Easy to Extend and Build New Natural Language Apps

Have a Conversation to Get Your Questions Answered

Future-Enabled: Easy to Configure Your Data for Natural Language Queries

Easy to Configure Your Data for Natural Language Queries

SQL Query Generation Process Flow

Key Takeaways

Summary

Select AI RAG

Objectives

Retrieval Augmented Generation (RAG)

Retrieval Using Semantic Similarity Search

Vector

The main operation on vectors is the mathematical distance between them.

Implementing RAG from Scratch - Typical RAG Pipeline

RAG Pipeline: Example

Using Select AI...enable RAG on your data in a couple of simple, declarative steps

Select AI Retrieval Augmented Generation (RAG)

Create a Vector Index Using an AI Profile and a Single PL/SQL Procedure

Select AI Retrieval Augmented Generation (RAG)

Example Using “NARRATE” on Oracle Machine Learning Blogs

Example Using “ RUNSQL ” on Oracle Machine Learning Blogs

New Select AI RAG Capabilities

Using Transformers Through the in-database ONNX Runtime

Summary

Select AI Agent

What are AI agents?

Benefits of Using AI Agents from Your Database

Select AI Agent: An Autonomous Agent Framework

Select AI Agent – An Autonomous Agent Framework

Tools: create_tool

Built-in Tool Types in the DBMS_CLOUD_AI_AGENT Package

Tasks: create_task

Select AI Agent: Task Instructions

- Agents: create_agent
- Agent Teams: create_team
- Agent Teams: run_team
- Agentic Select AI – Syntax
- SQL Command Line
- Integrated with Oracle AI Database Security
- Autonomous AI Database Fully Managed MCP Server

Select AI Proxy Integration

- Objectives
- Answer Questions About Data in a Wide Range of Data Stores
- Accessing Data from Remote Databases
- Use Select AI on an EBS Schema for NL2SQL
- Summary

What is MCP?

- MCP Benefits
- Examples of MCP Agents
- Benefits and Summary of MCP
- Examples of MCP Agents

Introducing the ADB MCP Server

- Autonomous AI Database MCP Server
- Comparing MCP Architectures
- Benefits of ADB MCP Server
- ADB MCP Server Differentiators
- Security and Governance
- ADB MCP Server Tools

Get Started with ADB MCP Server

- Getting Started with the Autonomous AI Database MCP Server
- Enable/Disable MCP Server
- Create an In-Database Tool Using Select AI Agent
- Create Select AI Agent Tool (continued...)
- Configure and Restart Your MCP client/AI Agent Application

MCP and Select AI

- Comparing MCP and Select AI – Highlighting NL2SQL
- Contrasting Tool Approaches
- Select AI Agent: An Autonomous Agent Framework
- Built-in Tool Types in the DBMS_CLOUD_AI_AGENT Package

Setting Up Developer Users for Success

- Objectives
- Developers Need to Manage Security
- Simplified Database User Management
- Schema Privileges
- Read-Only Users
- SQL Firewall: Use Case
- Allow Approved SQLs Only
- Summary

Using JSON in the Oracle AI Database

- Objectives
- Oracle Converged Database
- Oracle AI Database 26ai
- Autonomous AI JSON Database
- What is JSON?
- The Power of SQL Meets the Schema Flexibility of JSON
- SQL Meets JSON
- SQL/JSON
- Indexing
- JSON Collections
- Three Different Types of JSON Collections
- Seamless Mapping Relational to Document Model
- Oracle AI Database Is MongoDB Compatible* and More
- MongoDB Plug-and-Play: Oracle AI Database API for MongoDB
- Keep Using MongoDB Skills, Tools, and Frameworks
- Document Collections
- Oracle API for MongoDB
- SQL: Whenever You Need It
- JSON Document Relational Duality
- Duality Views
- JSON Relational Duality Views Are JSON Collections
- JSON Relational Duality View
- Defining a JSON Relational Duality View
- JSON Relational Duality View
- Example of Using Duality Views
- Oracle JSON AI Database: Common Usage Patterns

Application Development with JSON
Oracle Autonomous AI Database 26ai
Summary

Using Oracle Text in Autonomous AI Database

Objectives
Oracle Text in Oracle Autonomous AI Database
Handling Text Anywhere
Oracle Text
What is Oracle Text?
The Indexing Pipeline
Indexing Pipeline: Stages and Inputs
Oracle Text Queries
JSON Search Index
Faceted Navigation
Oracle Text
Oracle Text Analytics
DBMS_SEARCH
Hybrid Vector Index
Oracle Hybrid Vector Index
Hybrid Search: Common Terms
Hybrid Search: Different Terms
Vector Search Customizations
Best-of-class in-database search technologies for any use case
Summary

Using Spatial in Oracle Autonomous AI Database

Objectives
What is spatial data?
Autonomous AI Database Spatial Data Services
What is Spatial Studio?
How to Get Spatial Studio with ADB
Performing Spatial Analysis
Visualizing Results in Spatial Studio
Publishing and Sharing Spatial Studio Projects
What is Oracle Spatial AI?
Summary

Using Graph in Oracle AI Autonomous Database

Objectives

Graphs in Oracle AI Database 26ai

What is a graphs?

Defining a Property Graph View

Graphs in Oracle AI Database 26ai

What can you do with graphs?

Analyze Data Based on Connections in Your Data

Data-Driven Apps Create Value Using Graph Analytics

Graph Analytics: 60+ Prebuilt Algorithms

Find Important Vertices

Summary

Autonomous AI Lakehouse

Objectives

Why AI Struggles and the Lakehouse Solution

Give your AI & Analytics the enterprise data they deserve

The Solution: Oracle Autonomous AI Lakehouse

Iceberg and AI Lakehouse Capabilities

Why Iceberg Matters: Open Table Format = Freedom + Flexibility

The Best of Oracle AI Database PLUS Iceberg Data Lake

Self-Service AI Capabilities

Real-Time Data Pipelines with GoldenGate and Data Transforms

AI Lakehouse Features and Benefits

What makes the Autonomous AI Lakehouse Awesome?

Unified Enterprise View of Data with Autonomous AI Database Catalog

High Performance Data Access with Oracle Data Lake Accelerator

External Data Processing with In-Database Performance

Summary

Migration Consideration

Objectives

Migration to Autonomous AI Database

Database Migration Service

Oracle Cloud Migration Advisor

Tools for All Steps of the Migration Process

Manual Migration to Autonomous AI Database

Migration Methods: Overview

Loading and Import Options to ADB

- Autonomous AI Database Packages
- Using Oracle Object Store Staging
- Consider Network Latency When Moving Large Files
- Autonomous AI Database Statistics and Hints
- Autonomous AI Lakehouse
- Summary

Use Data Pump to Migrate to Autonomous AI Database

- Objectives
- Recommendations: Data Pump
- Recommendations: Data Pump Compression Comparison
- Tweaks: Data Pump
- ADB Compliance: Data Pump
- Summary

Migrate to Autonomous AI Database Using Transportable Tablespace (TTS)

- Objectives
- Using Transportable Tablespaces
- Migration to Autonomous AI Database Using Transportable Tablespaces
- Migration Workflow to Autonomous AI Database Using Transportable Tablespaces
- Transporting Transportable Tablespaces to Autonomous AI Database
- Limitations of Using Transportable Tablespaces
- Summary