

Oracle AI Database 26ai

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Nov 11, 2025



AI changes everything

The key to **thriving** in the age of AI is to transform yourself and your enterprise into an **AI leader**



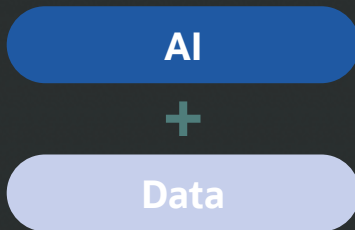
Oracle “**AI for Data**”
helps you to do just that





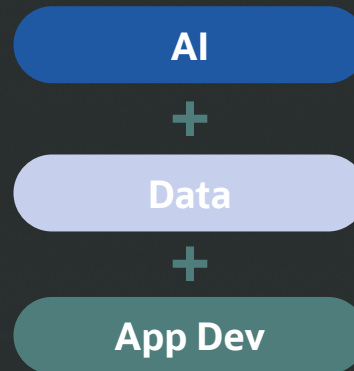
Oracle **AI** for Data

Architecting



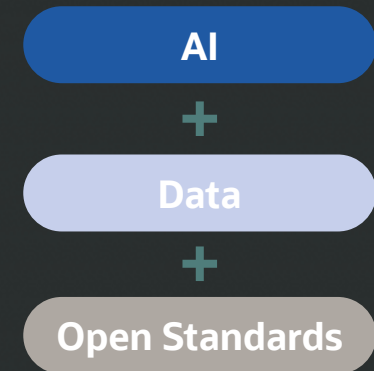
Enables **simpler**
and **better** results

Architecting



Enables rapid AI **innovation**
that enterprises can **trust**

Architecting



Enables AI insights for **all**
your data, **everywhere**



Architecting **AI** and **Data** together in four key product areas



AI Database



AI App Dev



AI Lakehouse



AI Data Platform



AI Database



AI App Dev



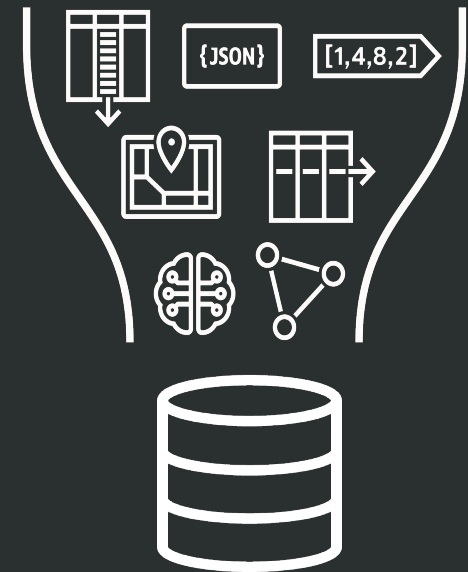
AI Lakehouse



AI Data Platform

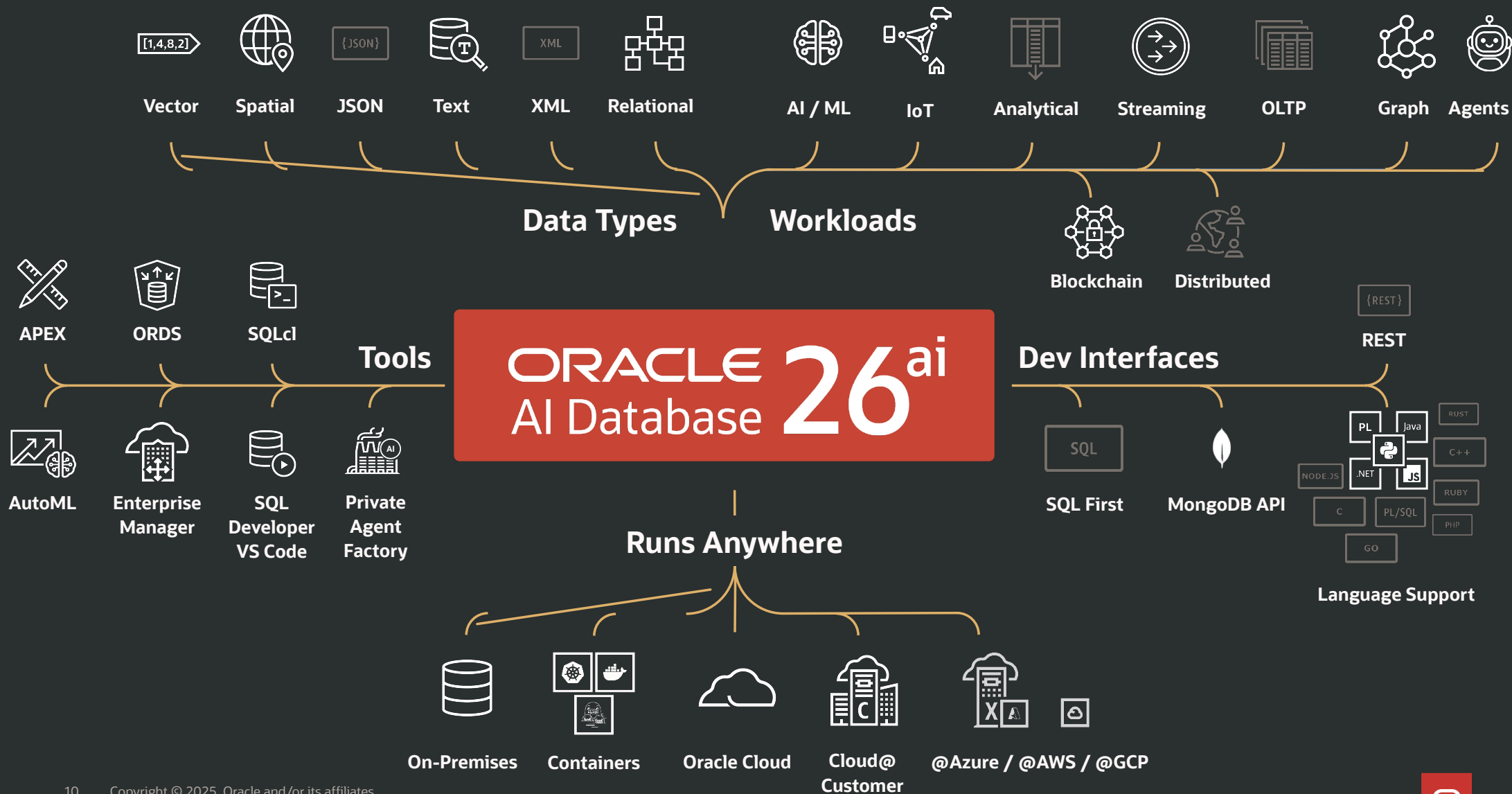
Oracle Database has always been

**A Complete and Simple Platform
Based on Open Standards
for All Your Data Needs**



Converged Architecture





Introducing **Oracle AI Database 26ai**

AI and Data Architected Together

ORACLE **26^{ai}**
AI Database

Next-generation **AI-native database**

Pervasive use of the two key AI breakthroughs: **LLMs** and **AI Vectors**

Dozens of new and improved AI for Data capabilities, built on time-proven enterprise data platform suitable for the most mission-critical workloads

Long-term support release is fully compatible with and **replaces** Oracle Database 23ai

- Oracle 23ai automatically **becomes** Oracle AI Database 26ai after the October 2025 Release Update is applied

Oracle AI Database 26ai Availability

Oracle has adopted a cloud-first, developer-first strategy

We have released Oracle AI Database first on the following cloud platforms:

Oracle Autonomous
Database

Oracle Exadata
Database Service

Oracle Base
Database Service

Oracle
Database@Azure

Oracle
Database@Google
Cloud

Oracle
Database@AWS

Oracle Database
installed in Oracle
Cloud Infrastructure
Compute VMs

For on-premises, we have released Oracle AI Database on the following platforms:

Exadata
Cloud@Customer

Compute
Cloud@Customer

Oracle Exadata
Database Machine

Oracle Database
Appliance

Oracle Private
Cloud Appliance

While the date for Oracle AI Database on other platforms has not been announced, we will update [My Oracle Support \(MOS\) Doc ID: 742060.1](#) when it is announced

Product Banner and Release Update (RU) Changes

Oracle **AI** Database **26ai** Enterprise Edition Release 23.0.0.0.0 - for Oracle Cloud and Engineered Systems

Version 23.26.0...

RU numbering change – release number (23) . **year** . **quarter** :

- January 2026 (1st calendar quarter) = release 23.26.1
- April 2026 (2nd calendar quarter) = release 23.26.2
- ...
- January 2027 = release 23.27.1

Upgrade Path to Oracle AI Database 26ai

11g
RELEASE 2

12^c

12^c
RELEASE 2

18^c

19^c

21^c



26ai

Multitenant Architecture
Only

Oracle AI Database focus areas



Mission-Critical
Workloads



Developers

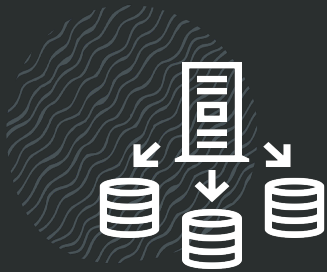


Artificial Intelligence

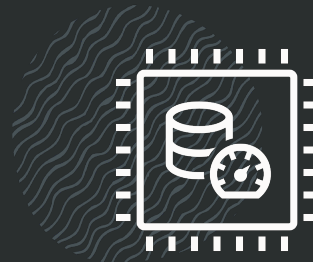
Mission Critical Workloads



Make **Mission-Critical Data** architecturally simple and scalable



RAFT Replication for
Globally Distributed Database



True
Cache



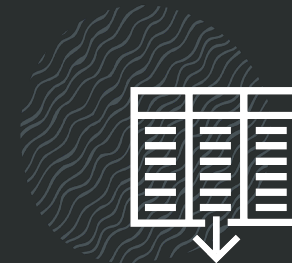
In-Database
SQL Firewall



Real-Time SQL Plan
Management



RAC, Exadata, Data Guard
Simplicity and Scalability



Real-time
Analytics

Mid-Tier Data Caching used in Applications

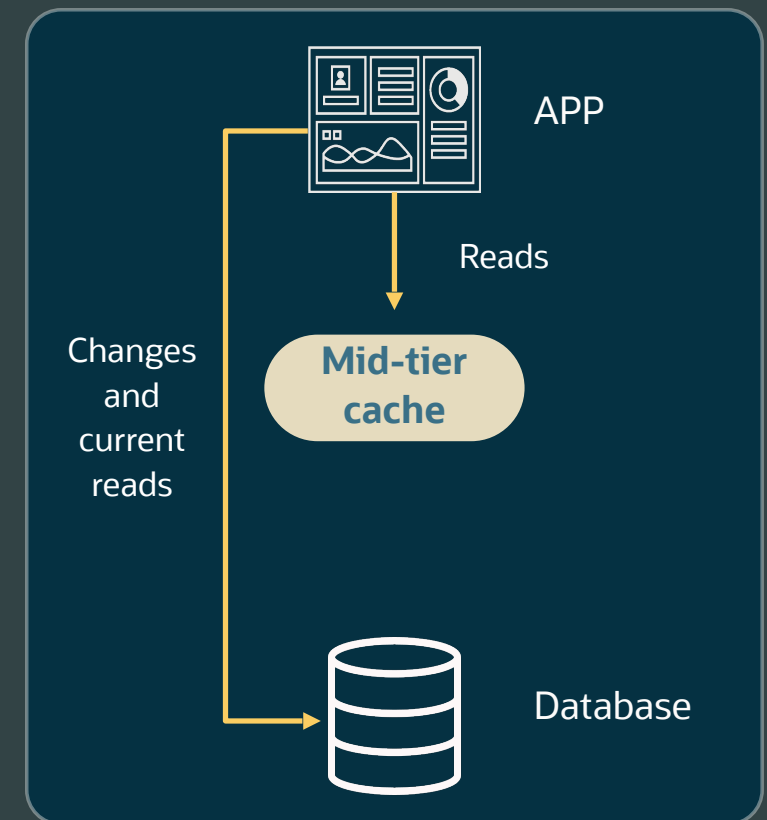
Applications often configure mid-tier caches to improve app response times and reduce the load on back-end databases

Today's mid-tier data caches are not caches

- They are app developer maintained
- Typically an inconsistent database subsets as developers are responsible for cache consistency

Reads that do not need the most current data are directed to the cache

Writes and current reads need to be sent to the backend database since that is the single source of truth



Next-Gen Performance with True Cache

Mitigating deficiencies of conventional caches

Reducing Latency—Improving Throughput



Simple



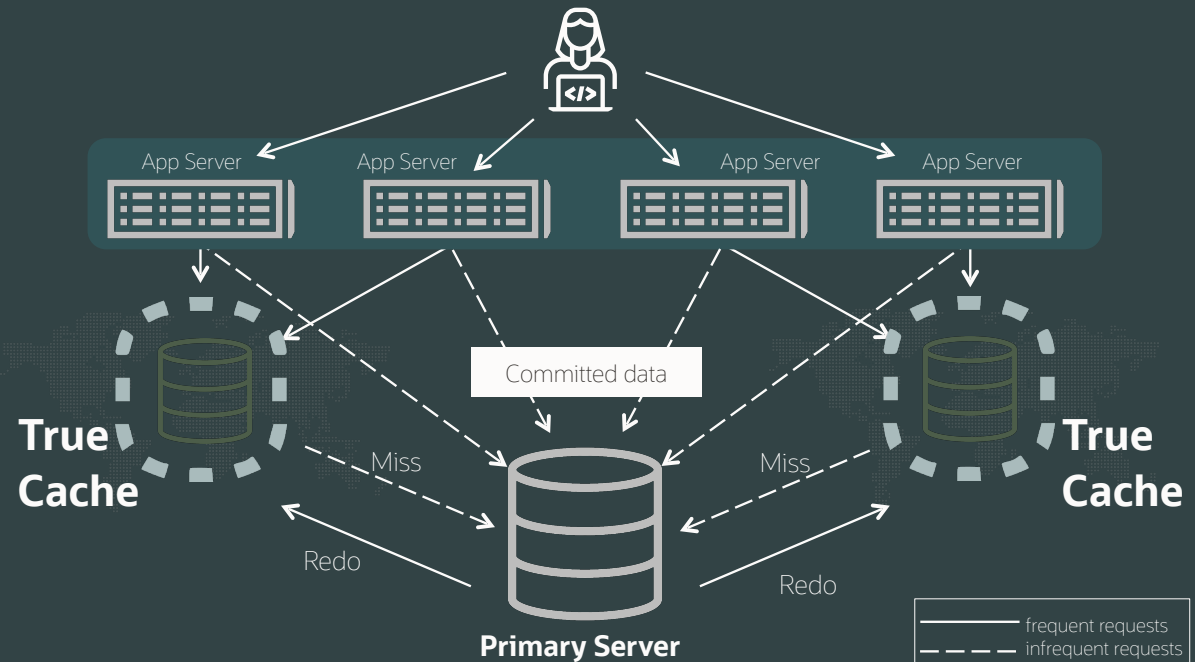
Consistent



Self-managed



SQL Cache



Oracle True Cache

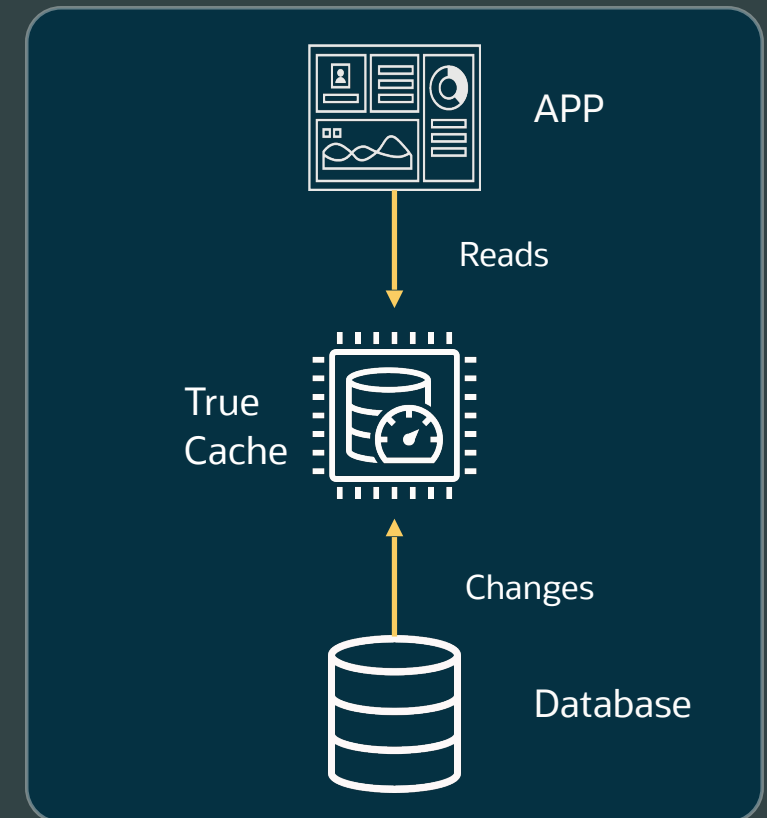
Oracle True Cache is a light-weight (nearly) disk-less Oracle AI Database instance that is deployed as a cache

ANY SQL Query can be easily directed to the cache instead of the back-end database

- **Unique** transparent full-function data cache

Data requested by queries not found in True Cache is **automatically** retrieved from the back-end database

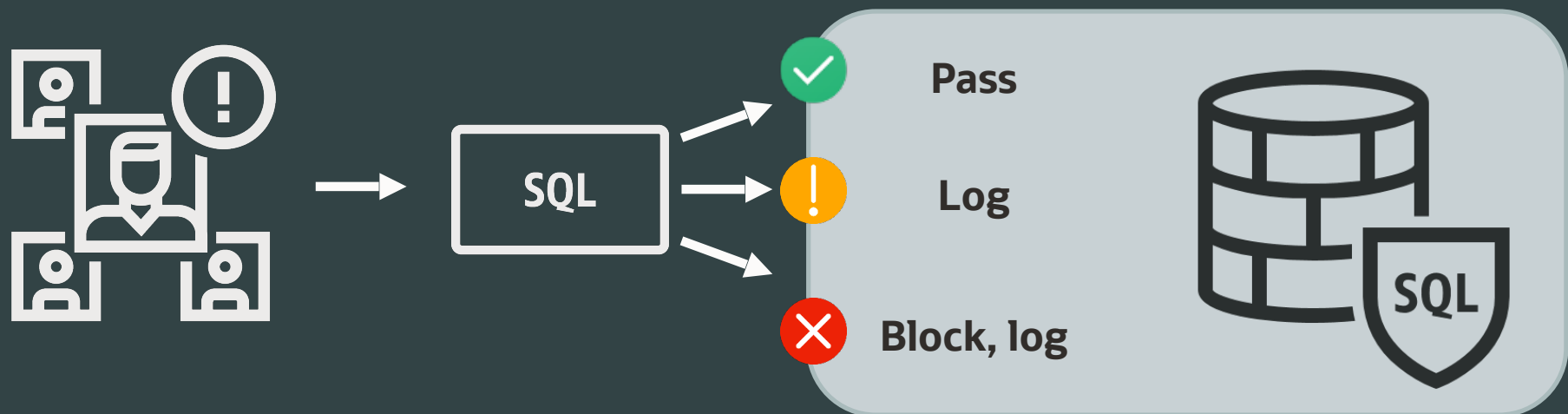
- Changes to data are **automatically** propagated to True Cache in **real-time**
- True Cache is **consistent** as of a point in time



Oracle SQL Firewall

Innovative security control solution to mitigate the risk of SQL injection attacks

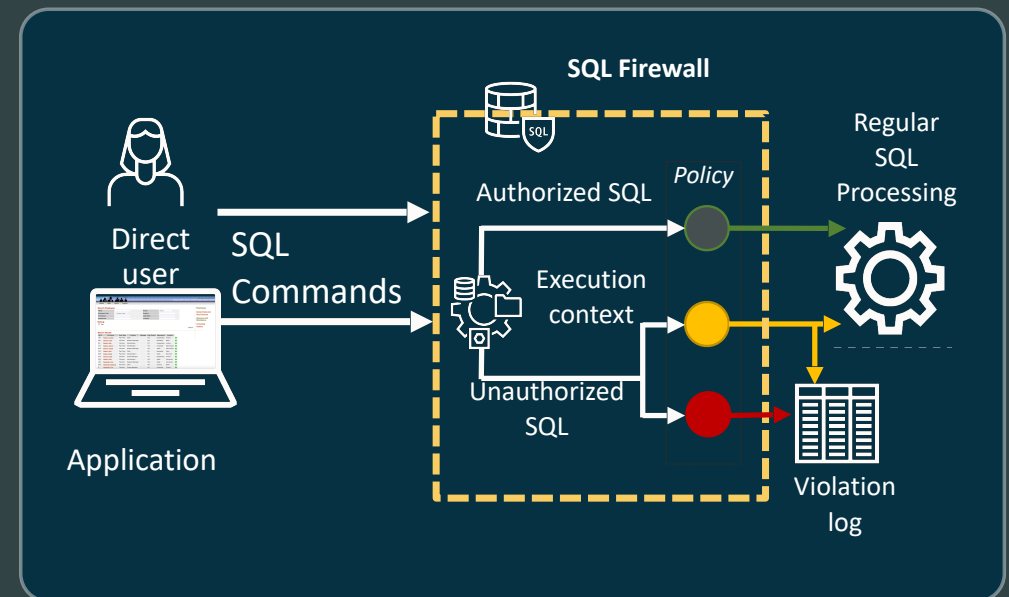
Oracle SQL Firewall offers protection against common database attacks by monitoring and blocking “**unauthorized SQL**” and SQL injection attacks



SQL Firewall is **built into** the database, ensuring that it **cannot be bypassed**
No extra hops, management, installation, patching, etc. of a mid-tier database firewall

Oracle SQL Firewall

- Strategically positioned
- Not possible to bypass
- No client-side configuration changes
- Quicker deployment
- Scales across your database estate
- Full visibility into ALL SQL traffic regardless of origin including top-level SQL, stored procedures, and related database objects
- Near-zero performance overhead



Automatic Caching of External Tables in Object Storage

Automatic external table caching transparently caches frequently accessed external tables residing in object storage

- Either completely or partially

Automatic external table caching boosts performance for external data

- Transparently caches frequently accessed content
- Requires no application changes

Faster, more efficient queries while the database handles caching and lifecycle management automatically

-- Create external table cache for your schema

BEGIN

```
DBMS_EXT_TABLE_CACHE.CREATE_CACHE (
  owner          => 'SALES',
  table_name     => 'STORE_SALES',
  partition_type => 'PATH');
```

An external table
pointing to data
stored on Object
Store

END;

/

-- Populate an entire table or a percentage of the external table into the cache

BEGIN

```
DBMS_EXT_TABLE_CACHE.ADD_TABLE (
  owner          => 'SALES',
  table_name     => 'STORE_SALES');
```

END;

/

-- Enable automatic caching of external tables for a specific user

BEGIN

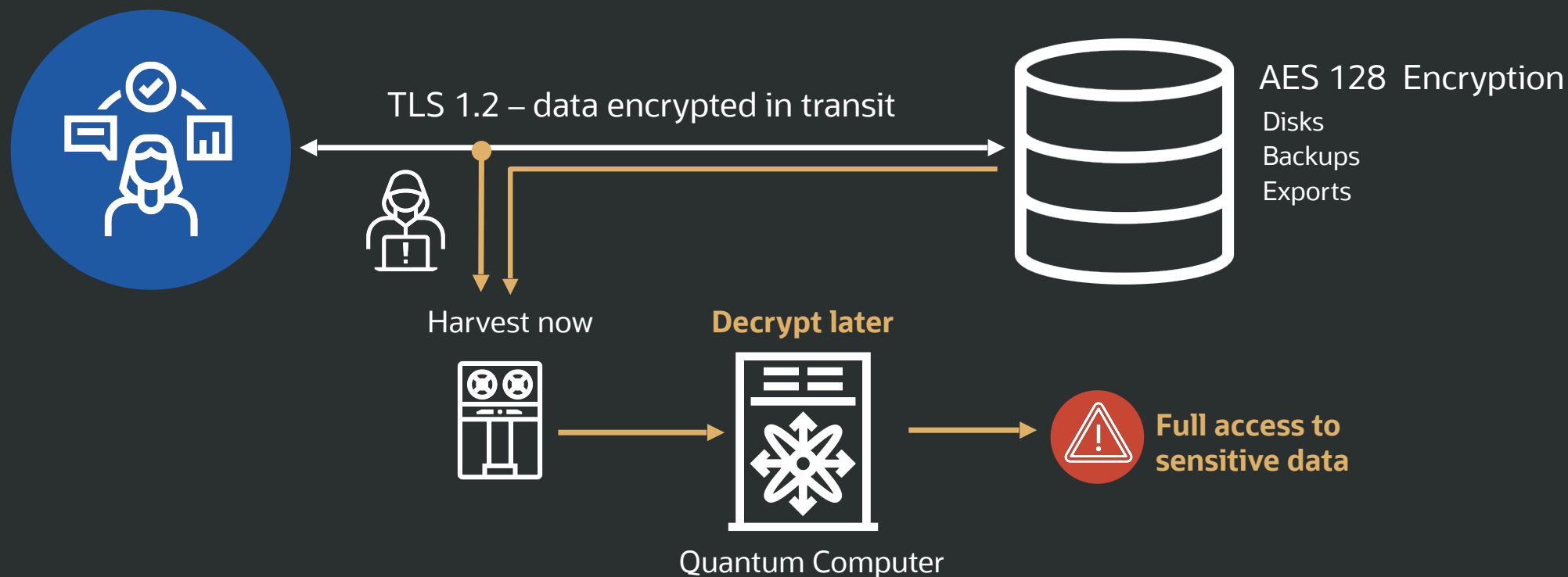
```
DBMS_CACHE.SET_USER_PROPERTY (
  property_name      => 'MAX_CACHE_PERCENT',
  property_value_num => 50,
  owner              => 'SALES');
```

END;

/

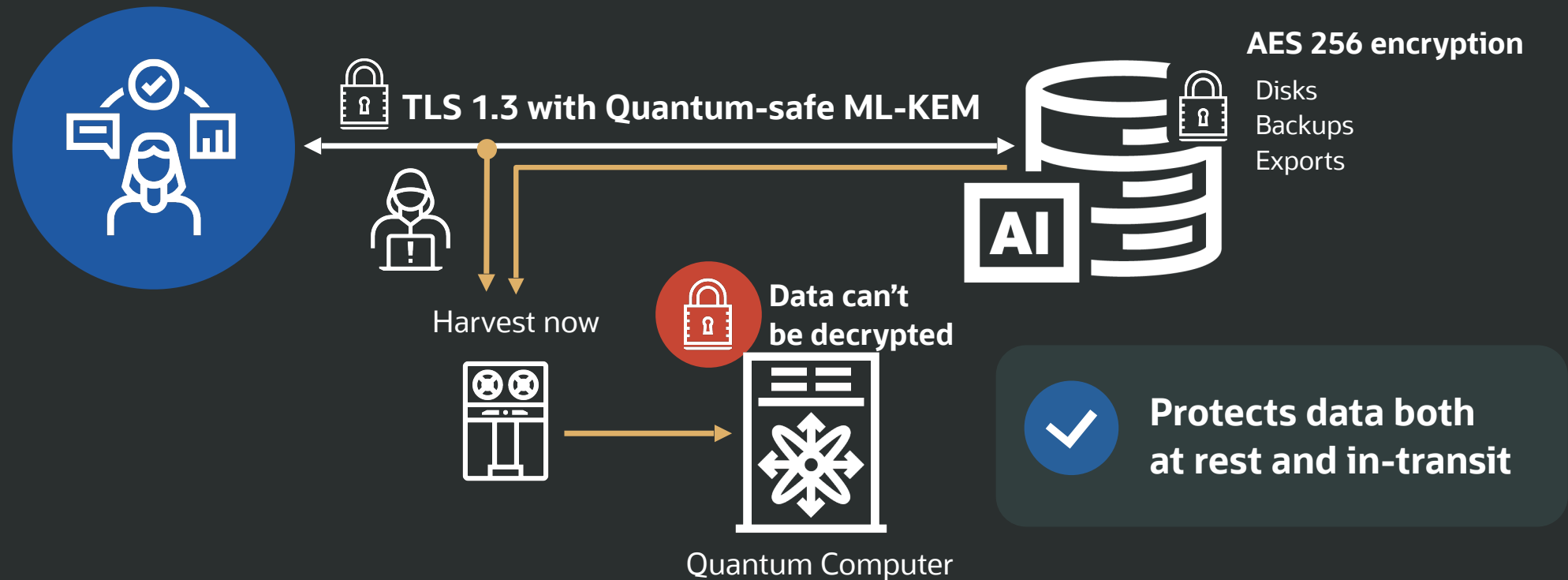
Quantum computing threatens encryption

Data harvested now could be decrypted later with Quantum computers



Quantum-resistant encryption

NIST-approved quantum-resistant encryption **in the database** with Oracle AI Database



Heat Map Retention Time

To implement an ILM strategy, you can use a Heat Map to track data access and modification

Heatmap info is captured in memory and periodically flushed to the HEAT_MAP_STAT\$ table in the SYSAUX tbs

With AI Database, users can set the number of days that the database retains Heat Map data before it is deleted

Using the new PL/SQL package DBMS_HEAT_MAP_ADMIN, users can specify Heat Map Retention Time

- Ranging from 1 day to 4,294,967,294 days

Retention times allow customers to optimize their storage by purging Heat Map data that is no longer required



```
DBMS_HEAT_MAP_ADMIN.SET_RETENTION_TIME(  
    days IN NUMBER);
```

Memory Speed Columnar

Next generation of Hybrid Columnar Compression (HCC)

Existing HCC uses an on-disk data format

- Best suited for analytical workloads
- Does not support in-memory columnar formats

Memory Speed Columnar introduces a new larger on-disk Compression Units (CUs)

- Leverages in-memory formats
- Enables Memory Speed Columnar scans in all storage tiers
- Eliminates the columnar format mismatch between HCC, Exadata flashcolumnar formats, and the DB In-Mem format
- Minimizes transformations
- Makes on-disk scans more efficient
- Improves processing efficiency
 - E.g. SIMD (Single Instruction/Multiple Data) operations

Optional extension to the existing HCC syntax

Can coexist with existing HCC objects

When to use Memspeed HCC?



Analytic Queries

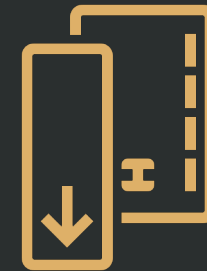
Up to **2x faster queries** as compared to HCC

Up to **6x faster** for CPU-bound table scans



Load

Up to **2x faster data load** for ARCHIVE compression level



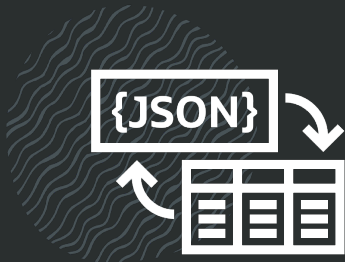
Transactions

COMPRESS FOR MEMSPEED
QUERY LOW ROW LEVEL
LOCKING recommended for workloads with DMLs and fetch-by-rowids

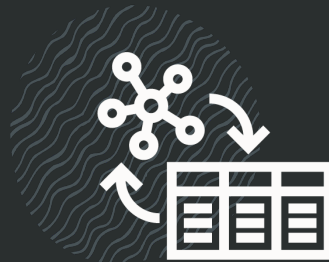
Developers



Make **Dev for Data** architecturally simple and scalable



JSON-Relational
Unification



Graph-Relational
Unification



JavaScript
Stored Procedures



Data Intent
Language



Lock-free Consistent Updates,
Long-running Transactions



Transactional
Microservices

Relational databases decompose application data into **independent components**, and store each component as a **row** in a separate table



Duality Views provide **more simplicity** AND **more power** than JSON databases, they enable each app to access ALL the data it needs as a single document

PURCHASE ORDER

SUPREMO CORPORATION

P.O. NUMBER	DATE
23781	01/20/2025

CUSTOMER

NAME

JOHN SMITH

COMPANY NAME

SUPREMO CORPORATION

ADDRESS

16050 S. US 22
POLES, MICHIGAN, 43509

PHONE

517-367-7010

EMAIL

johnsmith@mysmallbiz.org

DELIVERY INSTRUCTIONS

CODE	QUANTITY	PRODUCT DESCRIPTION	UNIT PRICE	AMOUNT
304-98632	4	Brake Discs, Pads & Calipers	111.36	445.44
501-35587	2	Control Arm	60.93	121.86
886-19386	2	Suspension Lift Kit	399.83	799.66

GET/PUT

1

Full Purchase Order
JSON

```
{
  "PO Number" : "23781",
  "date"      : "01/20/2025",
  "customer"  : "John Smith",
  "Address"   : "16040 S. US 27",
  "line items": [
    { "id" : "304-98632", "desc": "Brake Discs, Pads & Calipers", "quantity": 4, "unit price": 111.36, "amount": 445.44 },
    { "id" : "501-35587", "desc": "Control Arm", "quantity": 2, "unit price": 60.93, "amount": 121.86 },
    { "id" : "886-19386", "desc": "Suspension Lift Kit", "quantity": 2, "unit price": 399.83, "amount": 799.66 }
  ]
}
```

For example, they allow an Order Entry app to simply read or write a full purchase order to the database with a single REST operation, instead of multiple operations

get_graphql_schema constructs the GraphQL schema for a relational schema

New In
26^{ai}

Helps you understand

- How GraphQL types (database tables) are linked
- How to create GraphQL queries for the database



```
CREATE TABLE driver_race_map
(driver_race_map_id INTEGER PRIMARY KEY,
 race_id            INTEGER NOT NULL,
 driver_id          INTEGER NOT NULL,
 position           INTEGER,
 CONSTRAINT dr_race_map_uk  UNIQUE (race_id, driver_id),
 CONSTRAINT dr_race_map_fk1 FOREIGN KEY(race_id) REFERENCES race(race_id),
 CONSTRAINT dr_race_map_fk2 FOREIGN KEY(driver_id) REFERENCES driver(driver_id));

SELECT
DBMS_JSON_DUALITY GET_GRAPHQL_SCHEMA
  JSON('
    {"tableNames": ["DRIVER_RACE_MAP"],
     "schema": "F1"}
  ')
AS   GraphQL Schema";
```

get_graphql_schema constructs the GraphQL schema for a relational schema

New In
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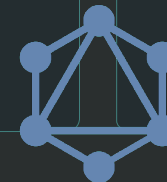


```
CREATE TABLE driver_race_map
(driver_race_map_id INTEGER PRIMARY KEY,
 race_id            INTEGER NOT NULL,
 driver_id          INTEGER NOT NULL,
 position           INTEGER,
 CONSTRAINT dr_race_map_uk  UNIQUE (race_id, driver_id),
 CONSTRAINT dr_race_map_fk1 FOREIGN KEY(race_id) REFERENCES race(race_id),
 CONSTRAINT dr_race_map_fk2 FOREIGN KEY(driver_id) REFERENCES driver(driver_id));

SELECT
DBMS_JSON_DUALITY GET_GRAPHQL_SCHEMA
  JSON('
    {"tableNames": ["DRIVER_RACE_MAP"],
     "schema": "F1"}
  ')
AS   GraphQL Schema";
```



```
GraphQL Schema
-----
{ "types" :
  [ { "Driver_race_map" :
    {
      "driver" :
      { "type" : "Driver",
        "nullable" : false,
        "quoted" : false
      },
      "race" :
      { "type" : "Race",
        "nullable" : false,
        "quoted" : false
      },
      "race_id" :
      { "type" : "Integer",
        "nullable" : false,
        "quoted" : false
      },
      "position" :
      { "type" : "Integer",
        "nullable" : true,
        "quoted" : false
      },
      "driver_race_map_id" :
    }
  ]
}
```



GraphQL Table Function for SQL

SQL table function `graphql` lets you query Oracle AI Database using the GraphQL open-source query language

- App developers can benefit from GraphQL's what-you-see-is-what-you-get syntax



```
CREATE TABLE team
(team_id    INTEGER PRIMARY KEY,
 name      VARCHAR2(255) NOT NULL UNIQUE,
 points    INTEGER NOT NULL);

SELECT JSON_SERIALIZE(data PRETTY) AS data FROM
GRAPHQL('
  team {
    id: team_id
    name
    points
  }
');
```

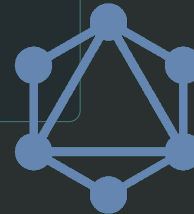
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```
CREATE TABLE team
  (team_id    INTEGER PRIMARY KEY,
   name       VARCHAR2(255) NOT NULL UNIQUE,
   points     INTEGER NOT NULL);

SELECT JSON_SERIALIZE(data PRETTY) AS data FROM
  GRAPHQL( '
    team {
      id: team_id
      name
      points
    }
  ');
```



```
DATA
-----
{
  "id" : 301,
  "name" : "McLaren Mercedes",
  "points" : 666
}

{
  "id" : 302,
  "name" : "Ferrari",
  "points" : 652
}

{
  "id" : 303,
  "name" : "Red Bull Racing Honda RBPT",
  "points" : 589
}

{
  "id" : 304,
  "name" : "Mercedes",
  "points" : 468
}

{
  "id" : 305,
  "name" : "Aston Martin Aramco Mercedes",
  "points" : 94
}

...
```

AI for Data



Oracle AI Database 26ai – Additional Features For App Dev



Data Intent Language



Lock-free Consistent Updates,
Long-running Transactions



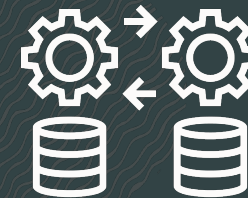
JavaScript
Stored Procedures



Boolean Datatype



Wider Tables



Transactional
Microservices

Where can you run Oracle AI Database 26ai Today

Oracle AI Database 26ai is available on

- Exadata, Oracle AI Database Appliance, Oracle Cloud at Customer, Autonomous Database, Exadata Database Service, Base Database Service, OCI IaaS, OCI VMWare Service, Oracle multicloud services (on GCP, Azure, AWS), Oracle Private Cloud Appliance
- Oracle AI Database Free (Linux, Windows, ARM-Linux), Autonomous Database Free Container Image, Always Free Autonomous Database



Oracle LiveLabs



livelabs.oracle.com



Oracle AI Database Free



oracle.com/database/free

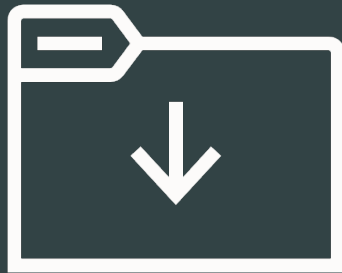
Try Oracle AI Database 26ai
Today on Livelabs

Upgrading to Oracle AI Database 26ai

- **Multitenant Architecture Only:** Leverage the power that it offers
- Beware of de-support and deprecation changes
 - Unified Auditing is the only supported model
 - Oracle AI Database 26ai is the last version that OLAP is supported



New in 26ai Upgrades



From **Oracle AI Database 26ai** onwards, you will download a Gold Image that already contains the most recent Release Update



Always patch
Out-of-Place

- Minimize downtime
- Avoid conflicts
- Easier rollback
- Use brand-new Oracle Home to avoid the need for rolling off patches before applying new ones

Try Everything...for FREE



AI Solutions Hub



oracle.com/aisolutions



Oracle LiveLabs



livelabs.oracle.com

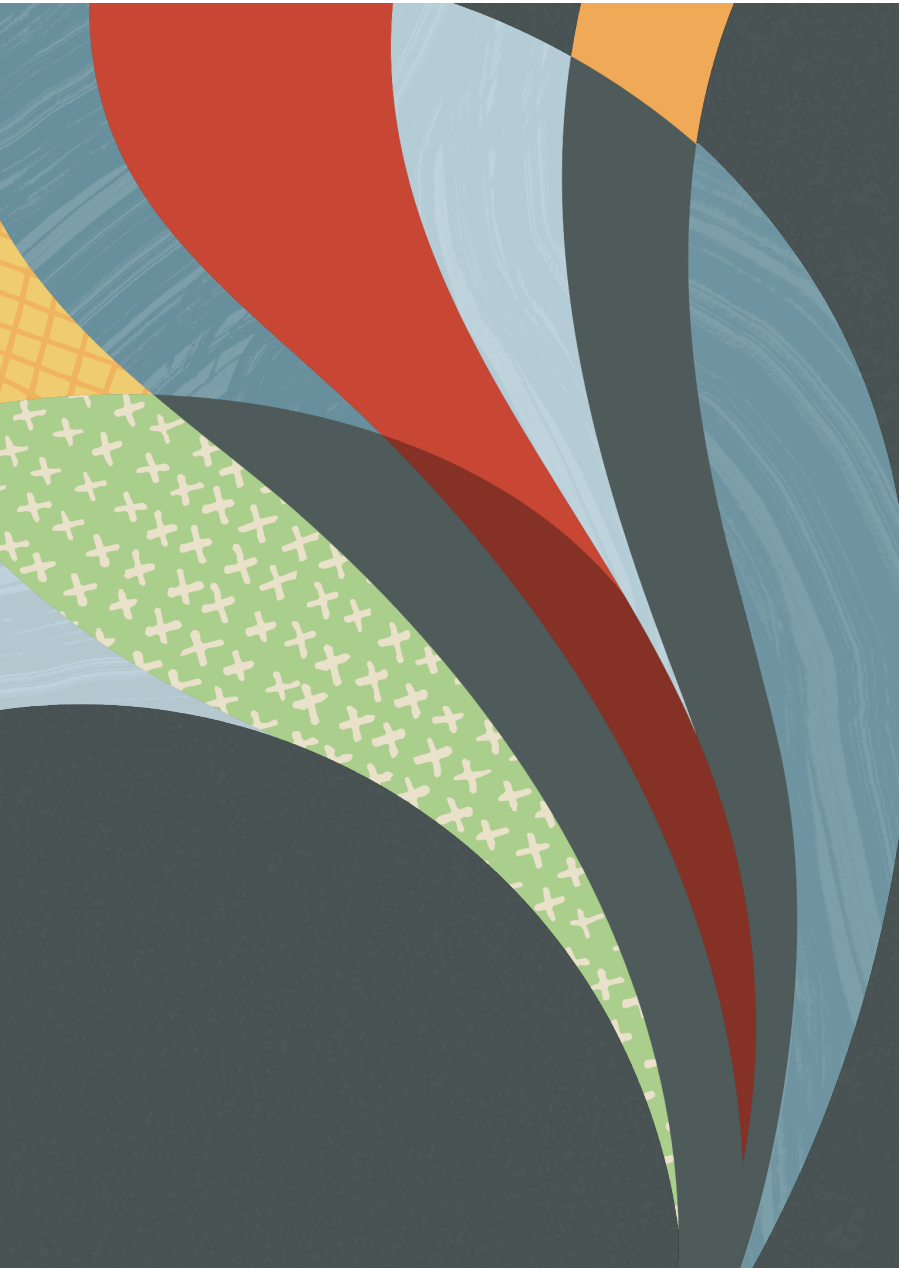


Oracle AI Database Free



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Thanks for joining

Checkout Oracle AI Database 26ai <http://www.oracle.com/database/26ai>

