

**Your  
Future  
Runs on  
Cloud**

Siófok  
2018. április 9-10.

Oracle  
**Cloud Day**

# Autonóm adatbázisok: gépi tanulás a működéskritikus rendszerekhez

- Think Autonomous Database:  
Machine Learning Meets Mission-Critical

Fekete Zoltán  
vezető műszaki tanácsadó, Oracle



**ORACLE®**

# 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.



# Próbálja ki az autonóm adatbázist! Jelentkezzen az ügyfél hands-on ATP workshopra!

2019. április 25.

jelentkezés: [Julia.Gyenes@oracle.com](mailto:Julia.Gyenes@oracle.com)

[Zoltan.Fekete@oracle.com](mailto:Zoltan.Fekete@oracle.com)

[Szabolcs.Radnai@oracle.com](mailto:Szabolcs.Radnai@oracle.com)

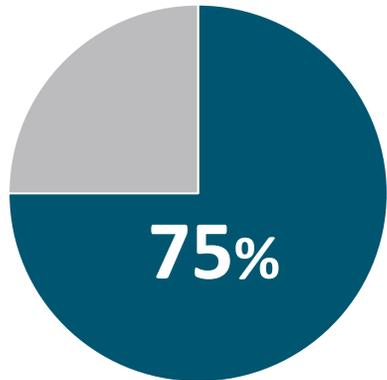
[Tibor.Slamovits@oracle.com](mailto:Tibor.Slamovits@oracle.com)

[https://apexapps.oracle.com/pls/apex/f?p=44785:50:16056833721841:::50:P50\\_COURSE\\_ID,P50\\_EVENT\\_ID:251,5925](https://apexapps.oracle.com/pls/apex/f?p=44785:50:16056833721841:::50:P50_COURSE_ID,P50_EVENT_ID:251,5925)

+

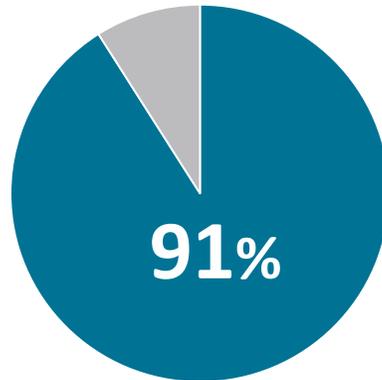
# In Pursuit of Optimal Data Management

## Cost & Complexity



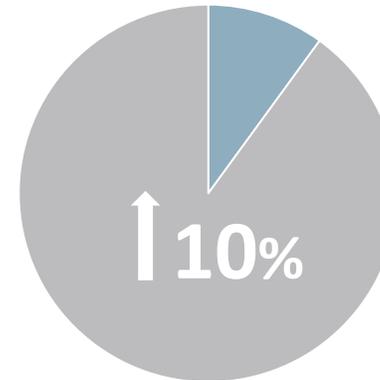
**3/4** Cost of Database Management spent on labor  
- [IDC](#)

## Reliability



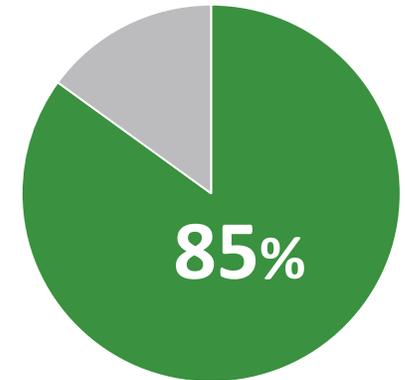
**91%** experience unplanned data center outages  
- [Healthcare IT News](#)  
Database downtime costs **\$7,900 / minute**  
- [DB Maestro](#)

## Speed of Innovation



**10%** increase in data accessibility translates into **\$65.7 million** in net income  
- [Baseline Magazine](#)

## Security

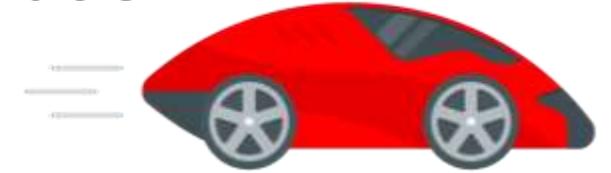


**85%** of security breaches occurred after the CVE was published  
- [DB Maestro](#)

# Az Oracle **ezt javasolja**: Autonomous Database

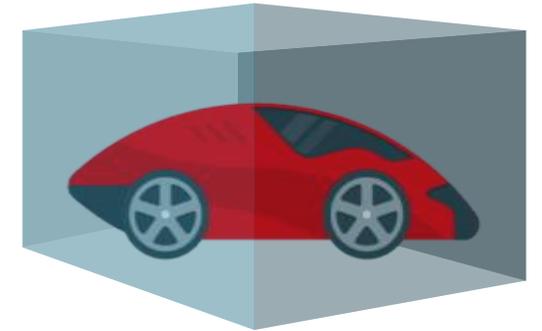
- **Self-Driving – önvezető**

- Kevesebb emberi hiba, kisebb költség, nagyobb produktivitás, ön-patchelés, ön-tuningolás, skálázás leállítás nélkül



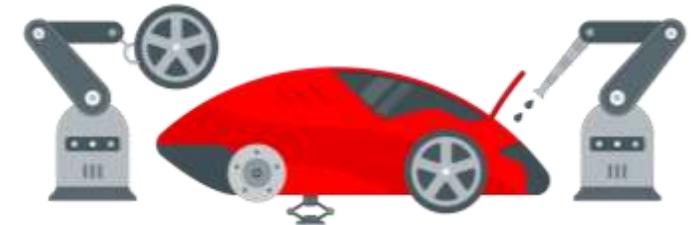
- **Self-Securing – önvédő, önálló biztonság**

- Védelem: külső támadások, ártó belső felhasználók ellen
- Patch-ek, titkosítás,...



- **Self-Repairing – önjavító**

- Automatikus védelem a leállítások ellen



# Autonomous Database Removes **Generic Tasks**

**Freedom from Drudgery** for DBA: More Time to **Innovate** and Improve the Business

- **Tasks Specific to Business and Innovation**

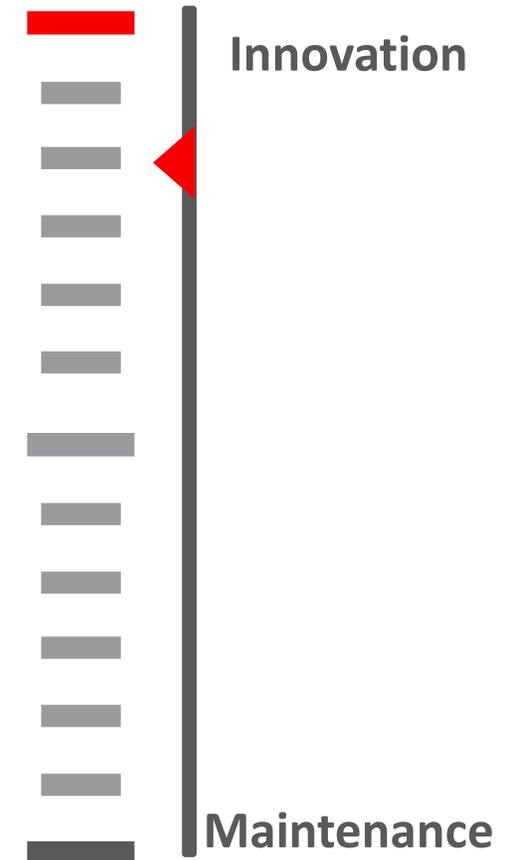
- Architecture, planning, data modeling
- Data security and lifecycle management
- Application related tuning
- End-to-End service level management

- ~~**Maintenance Tasks**~~

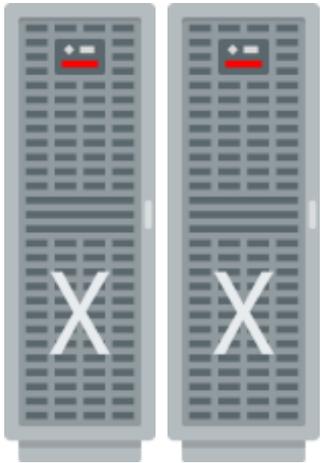
- ~~– Configuration and tuning of systems, network, storage~~
- ~~– Database provisioning, patching~~
- ~~– Database backups, H/A, disaster recovery~~
- ~~– Database optimization~~



## Value Scale



# Exadata: a legmodernebb adatbázis infrastruktúra



**Exadata  
On-Premises**



**Exadata  
Cloud at  
Customer**



**Exadata  
Cloud  
Service**



**Autonomous  
Database Cloud**



# Full Database Lifecycle is Automated



## Provisioning

Rapidly creates **scalable mission critical** databases

---

Creates **Exadata<sup>+</sup>** Cloud Infrastructure, **RAC<sup>+</sup>** scale-out database, **Active Data Guard<sup>+</sup>** standby



## Security

Protects from external and internal threats

---

Monitors threats, applies security **updates online<sup>+</sup>**, stops admin snooping with **DB Vault<sup>+</sup>**, **encrypts** all data



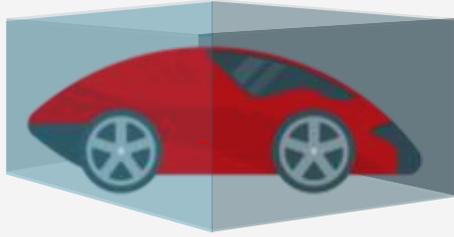
## Management

Automates all infrastructure and database management

---

Performs **all OS and SYSDBA** operations, tunes settings, patches all software **online<sup>+</sup>**, diagnoses **errors<sup>+</sup>**

# Full Database Lifecycle is Automated



## Protection

Recovers from any failure without downtime

---

Automates backup, restore, **application transparent<sup>+</sup>** failover in **scale-out cluster<sup>+</sup>** or to **active remote standby<sup>+</sup>**



## Scaling

Scales online for highest performance and lowest cost

---

**Instant online elasticity<sup>+</sup>** of **serverless** compute and storage enables **true pay-per-use<sup>+</sup>**



## Optimization

**Machine Learning** optimizes database for each workload

---

Continuously optimizes memory, **data formats**, **indexes<sup>+</sup>**, **parallelism<sup>+</sup>**, and **plans<sup>+</sup>** for each workload

## Create Autonomous Data Warehouse [help](#) [cancel](#)

### COMPARTMENT

Demo

### DISPLAY NAME

ADWCdemo

### DATABASE NAME

ADWCDEMO

The name must contain only letters and numbers, starting with a letter. 14 characters max.

### CPU CORE COUNT

1

The number of CPU cores to enable. Maximum cores per database: 128. Available cores are subject to your tenancy's service limits.

### STORAGE (TB)

1

The available storage, up to 126 TB.

### Administrator Credentials

Set the password for your Autonomous Data Warehouse ADMIN user here:

USERNAME READ-ONLY

ADMIN

PASSWORD

••••••••••

CONFIRM PASSWORD

••••••••••

### LICENSE TYPE

MY ORGANIZATION ALREADY OWNS ORACLE DATABASE SOFTWARE LICENSES

Bring my existing database software licenses to the database cloud service ([details](#)).

SUBSCRIBE TO NEW DATABASE SOFTWARE LICENSES AND THE DATABASE CLOUD SERVICE

Fill in the Compartment, Display Name, Database Name, set Password and Confirm Password for the ADMIN user fields. Scroll down

New / Select Database Connection

Connection Na...	Connection De...
------------------	------------------

Connection Name admin@testdw

Username admin

Password .....

Save Password  Connection Color

**Oracle**

Connection Type Cloud Wallet Role default

Configuration File askan/Downloads/Wallet\_testdw.zip

Service testdw\_high

Use HTTP Proxy

OS Authentication  Kerberos Authentication

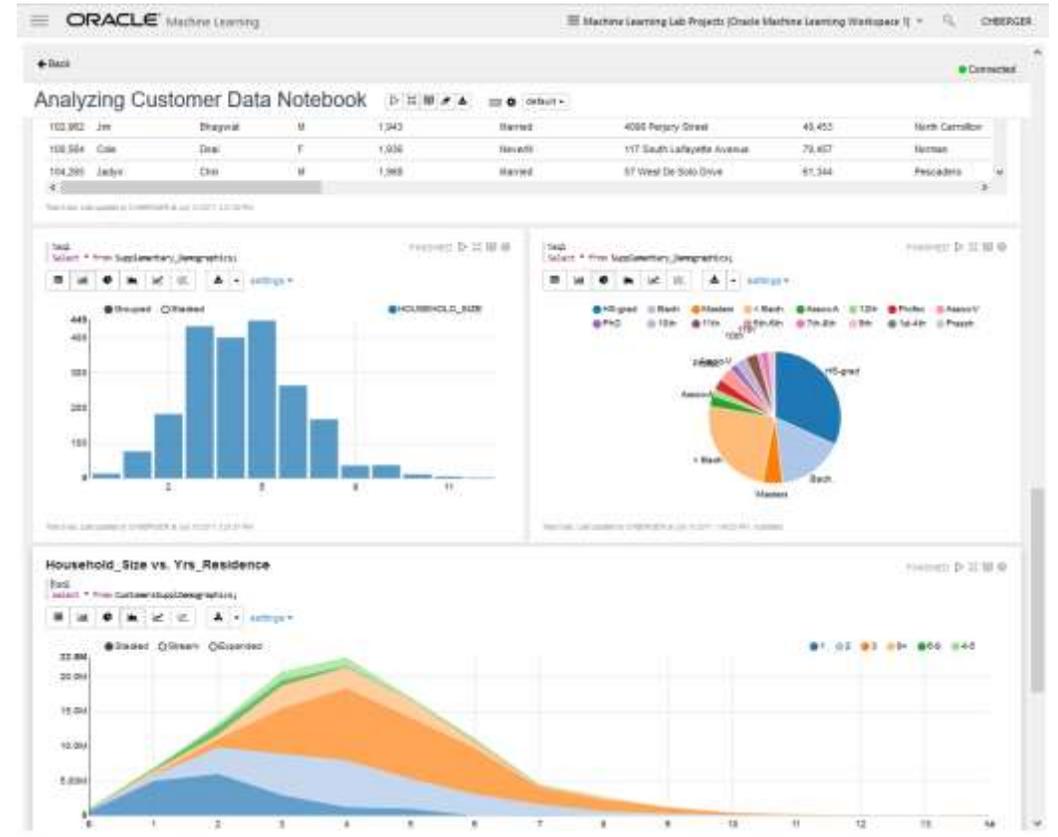
testdw\_high  
testdw\_high  
testdw\_low  
testdw\_medium

Status :



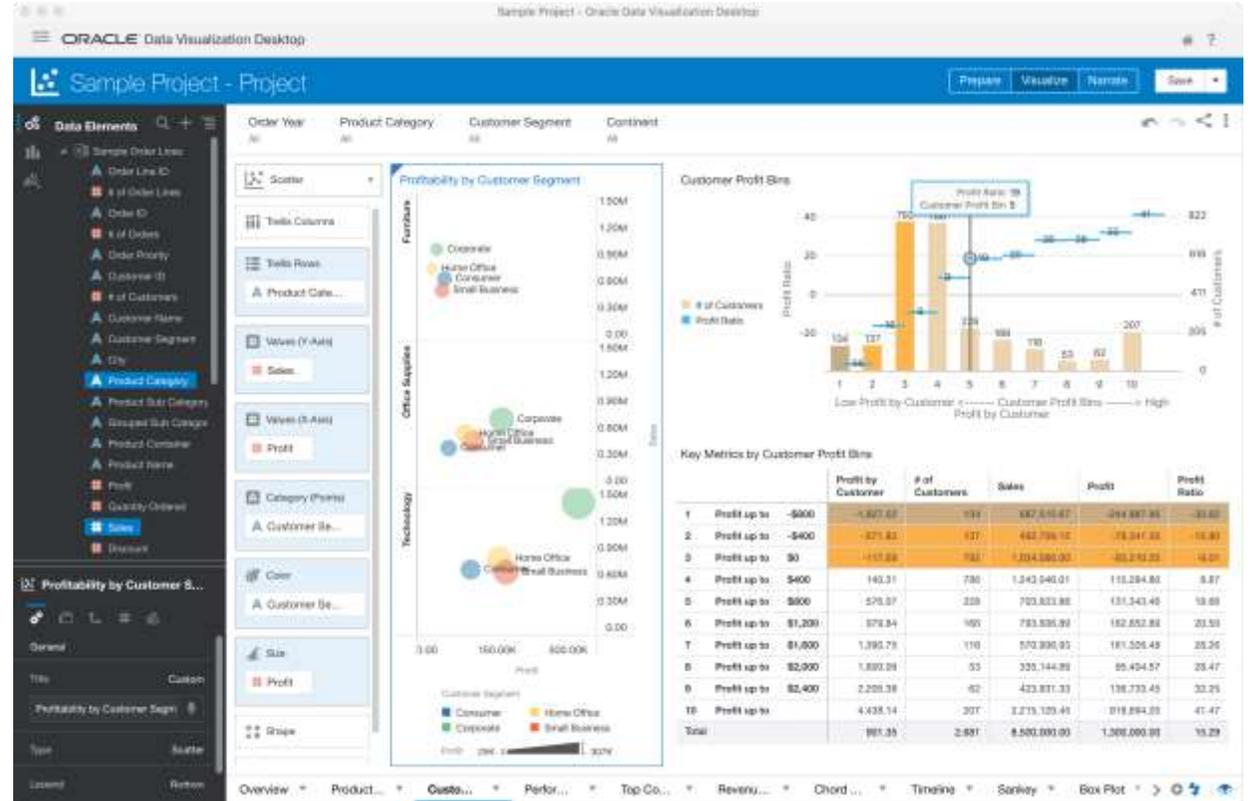
# Oracle ML: Built-in Notebooks

- Quickly start running queries with built-in web-based notebooks
  - No need to install a client query tool
- Initially supports SQL and PL/SQL
- Based on Apache Zeppelin
- **Roadmap**
  - R and Python support
  - Common UI for data scientists across multiple services



# Oracle Data Visualization Desktop

- Self-service data exploration for business users
  - Rich, interactive visualizations
- Included with ADW free of charge for unlimited number of users
  - Also available as cloud version within Oracle Analytics Cloud



# Data Loading Options

- Data loading via SQL\*Net, JDBC
  - Suitable for small volumes of data
    - SQL\*Loader from local filesystem
    - ETL scripts that use DML to insert data
    - Data integration tools, e.g. ODI
  - Use FastConnect for higher bandwidth for larger data volumes
- Data loading from Oracle Object Storage
  - Preferred method for large volumes of data

# Data Loading Example

```
begin
  dbms_cloud.copy_data(
    table_name => 'CHANNELS',
    credential_name => 'OBJ_STORE_CRED',
    file_uri_list => 'https://swiftobjectstorage.us-ashburn-1.oraclecloud.com/v1/adwdemo/DEMO_DATA/channels.csv',
    format => json_object( 'type' value 'CSV', 'skipheaders' value '1' )
  );
end;
/
```

## channels.csv

```
"CHANNEL_ID","CHANNEL_DESC","CHANNEL_CLASS","CHANNEL_CLASS_ID","CHANNEL_TOTAL","CHANNEL_TOTAL_ID"
3,"Direct Sales","Direct",12,"Channel total",1
9,"Tele Sales","Direct",12,"Channel total",1
5,"Catalog","Indirect",13,"Channel total",1
4,"Internet","Indirect",13,"Channel total",1
2,"Partners","Others",14,"Channel total",1
```

# Autonomous Optimizations | Specialized by Workload

## Autonomous Data Warehouse

## Autonomous Transaction Processing



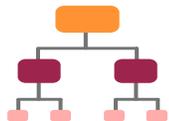
Optimizes Complex SQL

Optimizes Response Time



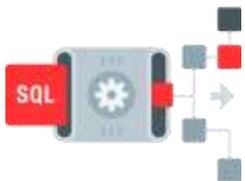
Columnar Format

Row Format



Creates Data Summaries

Creates Indexes



Plan Stability and Run Away Query Prevention

# Autonomous Transaction Processing Use Cases

## Departmental or Mission Critical Applications<sup>1</sup>



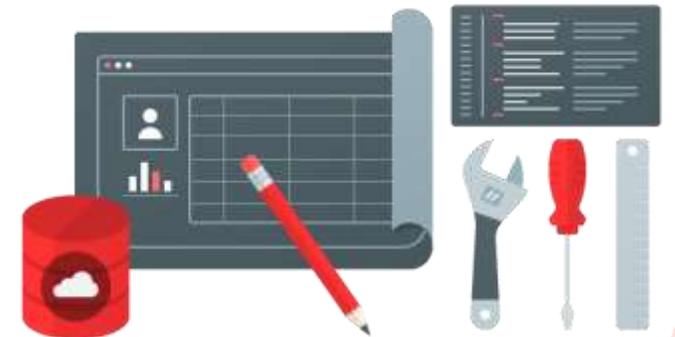
Support Business Operations

## Mixed Workloads



Real-Time Analytics and Machine Learning

## Application Development



Innovate Faster

**Table 1-8 Performance**

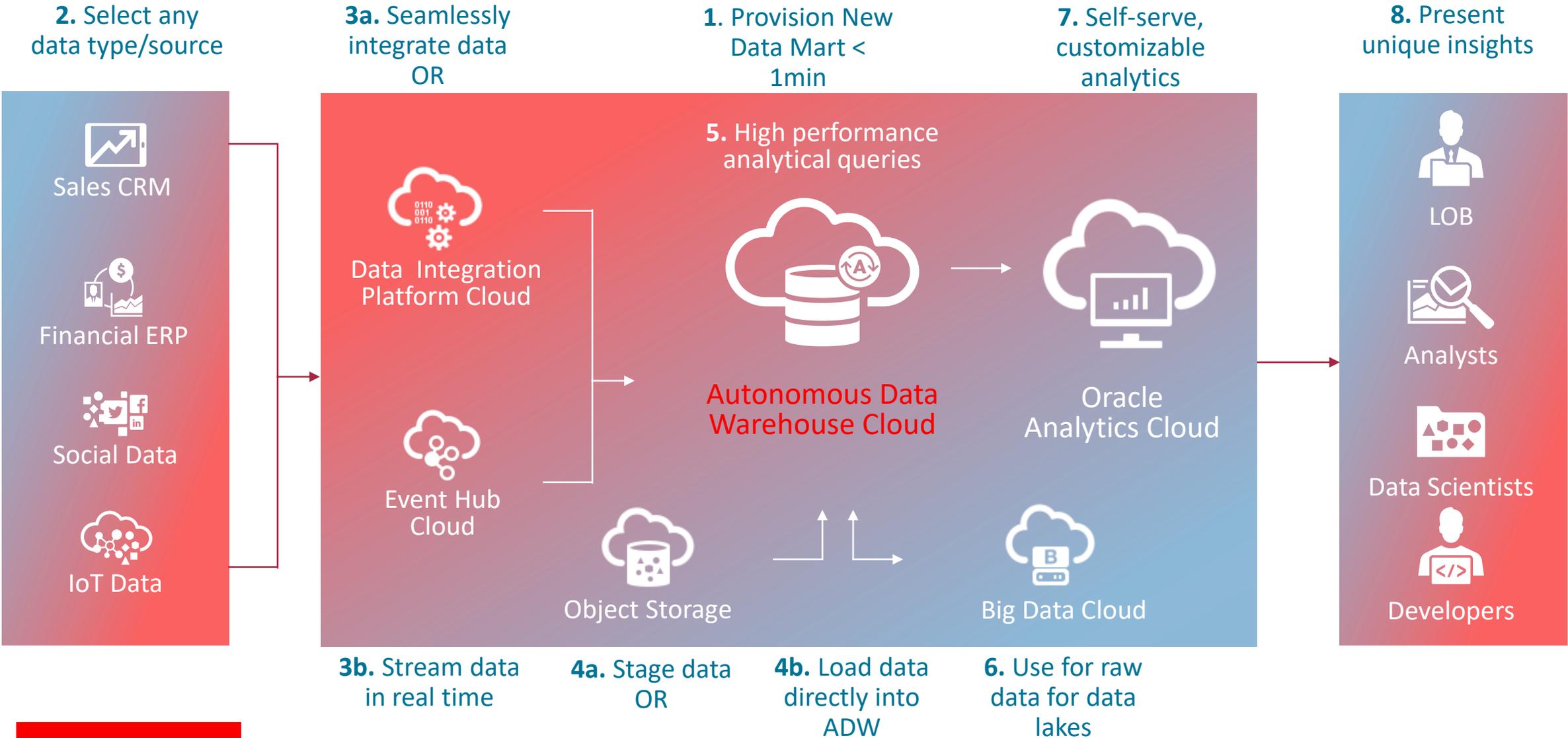
<https://docs.oracle.com/en/database/oracle/oracle-database/19/dblic/database-licensing-information-user-manual.pdf>

19c

Feature / Option / Pack	SE2	EE	EE-ES	DBCS SE	DBCS EE	DBCS EE-HP	DBCS EE-EP	ExaCS	Notes
Automatic Indexing	N	N	Y	Y	Y	Y	Y	Y	EE-ES: Available on Exadata. Not available on Oracle Database Appliance.
SQL Quarantine	N	N	Y	Y	Y	Y	Y	Y	EE-ES: Available on Exadata. Not available on Oracle Database Appliance.
Real-Time Statistics	N	N	Y	Y	Y	Y	Y	Y	EE-ES: Available on Exadata. Not available on Oracle Database Appliance.
High-Frequency Automatic Optimizer Statistics Collection	N	N	Y	Y	Y	Y	Y	Y	EE-ES: Available on Exadata. Not available on Oracle Database Appliance.
Client Side Query Cache	N	Y	Y	N	Y	Y	Y	Y	
Query Results Cache	N	Y	Y	N	Y	Y	Y	Y	
PL/SQL Function Result Cache	N	Y	Y	N	Y	Y	Y	Y	



# Follow the Data! *Storyline*



# Oracle University – online courses for Autonomous Database

## Topics:

### Oracle Autonomous Database Workshop

- Provision Autonomous Database instance
- Use Oracle Machine Learning with Autonomous Database
- Identify the typical workflow for using Autonomous Database
- Work with data sets
- Monitor and manage Autonomous Database Cloud service instances

- Load data into service instances

Level:  
a great starting point for  
developers,  
administrators, architects

# Oracle University – online course for Machine Learning

## Topics:

### Using Oracle Machine Learning with Autonomous Database

- Features in OML that will enable effective collaboration in a global workspace
- Identify Oracle Cloud services that are compatible with Oracle Machine Learning
- Explain the capabilities and features of Oracle Machine Learning (OML)
- Explore data visualizations capabilities of Oracle Analytics Cloud

- Creating Visualizations in Oracle Machine Learning Using Analytics Cloud

Level:  
a great starting point for  
Analysts, Data Scientist,  
Managers

# Oracle DB 11.2-19c

<https://apex.oracle.com/database-features/>

- 19c: 91 NF

The screenshot displays the Oracle Apex website page titled "https://apex.oracle.com/database-features/". The page lists several database features for Oracle 19c, each with a green checkmark icon indicating it is a new feature. The features listed are:

- Automatic Indexing**: The automatic indexing feature automates index management tasks, such as creating, rebuilding, an...  
Tags: 19c Release, Indexes
- Automatic Resolution of SQL Plan Regressions**: SQL plan management searches for SQL statements in the Automatic Workload Repository (AWR). P...  
Tags: 19c Release, SQL Plan Management
- Automatic Support for Both SASL and Non-SASL Active Directory Connections**: Starting with this release, both Simple Authentication and Security Layer (SASL) and Transport Layer ...  
Tags: 19c Release, Active Directory
- Big Data and Performance Enhancements for In-Memory External Tables**: In-Memory external tables add support for ORACLE\_HIVE and ORACLE\_BIGDATA drivers, parallel que...  
Tags: 19c Release, In-Memory Column Store
- Bitmap based count distinct SQL Function**: New bitvector SQL operators can be used to speed up COUNT DISTINCT operations within a SQL qu...  
Tags: 19c Release, SQL
- Clear Flashback logs periodically for increased FRA size predictability**

## Safe Harbor Statement

The preceding 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.

# Integrated Cloud

## Applications & Platform Services

ORACLE®