Oracle Cloud Infrastructure, Data and AI

Lance Olson

Vice President of Product Management

Data and AI

Cloud for your critical enterprise apps and data

First Generation Cloud	Oracle Cloud
Elastic resources	Superior performance
Pay for what you use	Superior economics
High scale	Enterprise class
Self-service	Security first
Easy to use	Open ecosystem

Complete Enterprise Platform

Partner Ecosystem

Altair | Couchbase NoEQUAL | FORTINET | Microsoft | paloalto NETWORKS | vmware

Next Layer Services

Low Code	Analytics & AI	Integration	Hybrid Services	Migration/Hybrid
Digital Assistant	Oracle Analytics	Integration	Azure Interconnect	Identity (AD, SSO, LDAP)
Visual Builder	Data Science / AI Svcs	Data Integration	Exadata Cloud@Customer	VMware Solution

Developer Services

AppDev	DevOps	Container Ecosystem	Serverless	Observability
CI/CD/Deployment	Dev Tools / Resource Mgr	Kubernetes / Registry / API	Functions / Events	Monitoring / Logging

Data Services

DBaaS/ExaCS	Autonomous Database	Other Data	Other Data Mgmt	Big Data
VM and Bare Metal	Dedicated and Serverless	NoSQL	Database Migration	Big Data / Data Flow
Exadata Cloud Service	ADW and ATP	Streaming / Kafka	Data Catalog	Data Integration

Core Services

Compute/OS	Storage	Networking	Security		Governance & Management
Bare Metal	Block	VCN	KMS	Virtual Vaults	Compartments & Tags
VMs / Dedicated VMs	Object	Cluster Networking	Policy / Data Safe		Audit
GPU shapes	Object Archive	Load Balancer	Identity	Secrets Mgmt	Email
High frequency CPUs	File	Service Gateway	CASB	Cloud Guard	Notifications
Autonomous Linux	Import Appliance	FastConnect / IPSec	WAF		Cost Management
OS Management	Storage Gateway	DNS	DDoS		

Regions

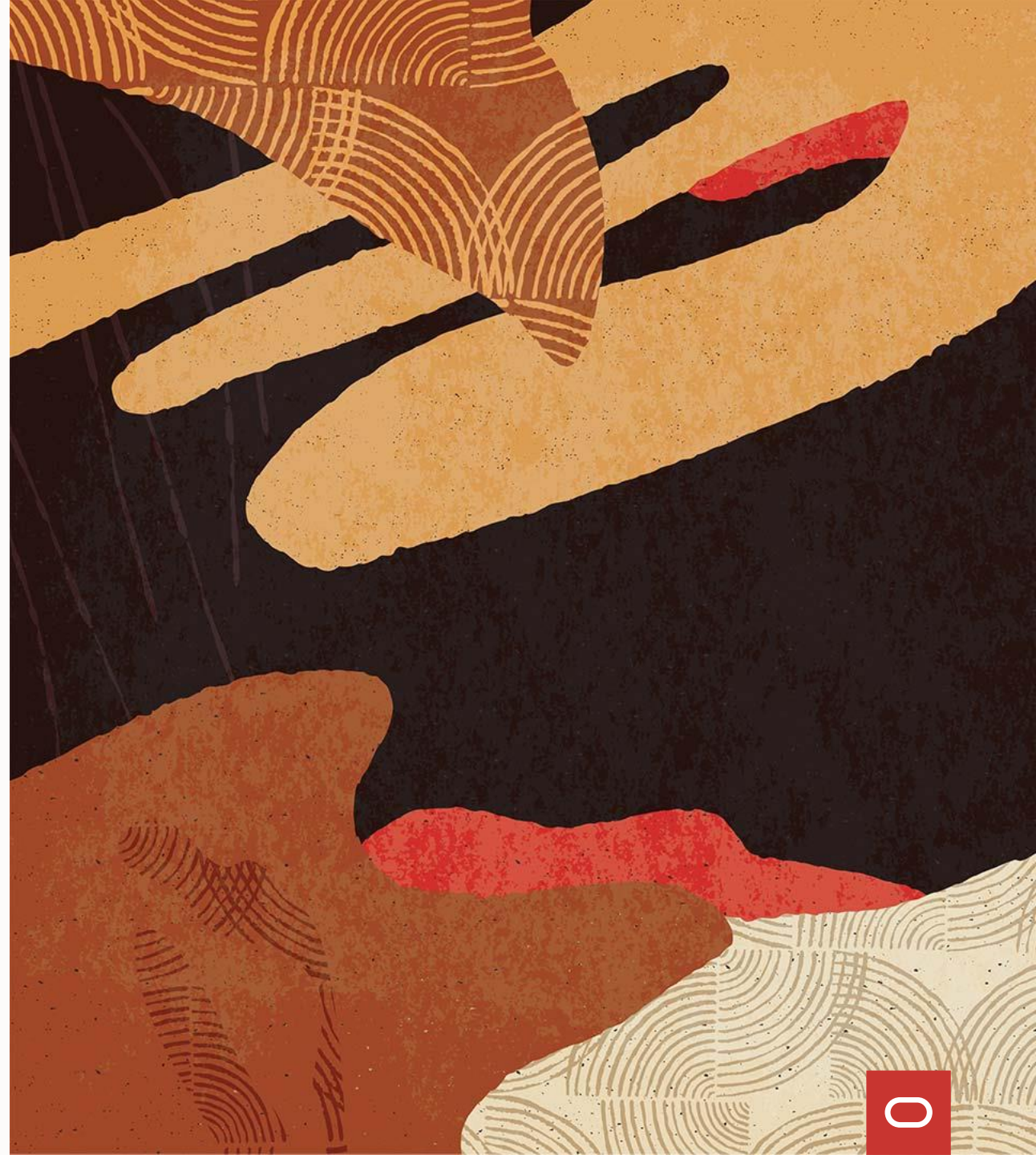| Phoenix	Ashburn	Toronto	Frankfurt	London	Zurich	Tokyo	Mumbai	Sydney	Seoul
US Gov (2)	US DoD (3)	Montreal	Sao Paulo	UK Gov	Amsterdam	Osaka	Hyderabad	Melbourne	Jeddah

29 Oracle Cloud regions and growing

November 2020: 29 Regions Live, 9+ Planned; 6 Azure Interconnect Regions

SWEDEN
LONDON
NEWPORT
AMSTERDAM
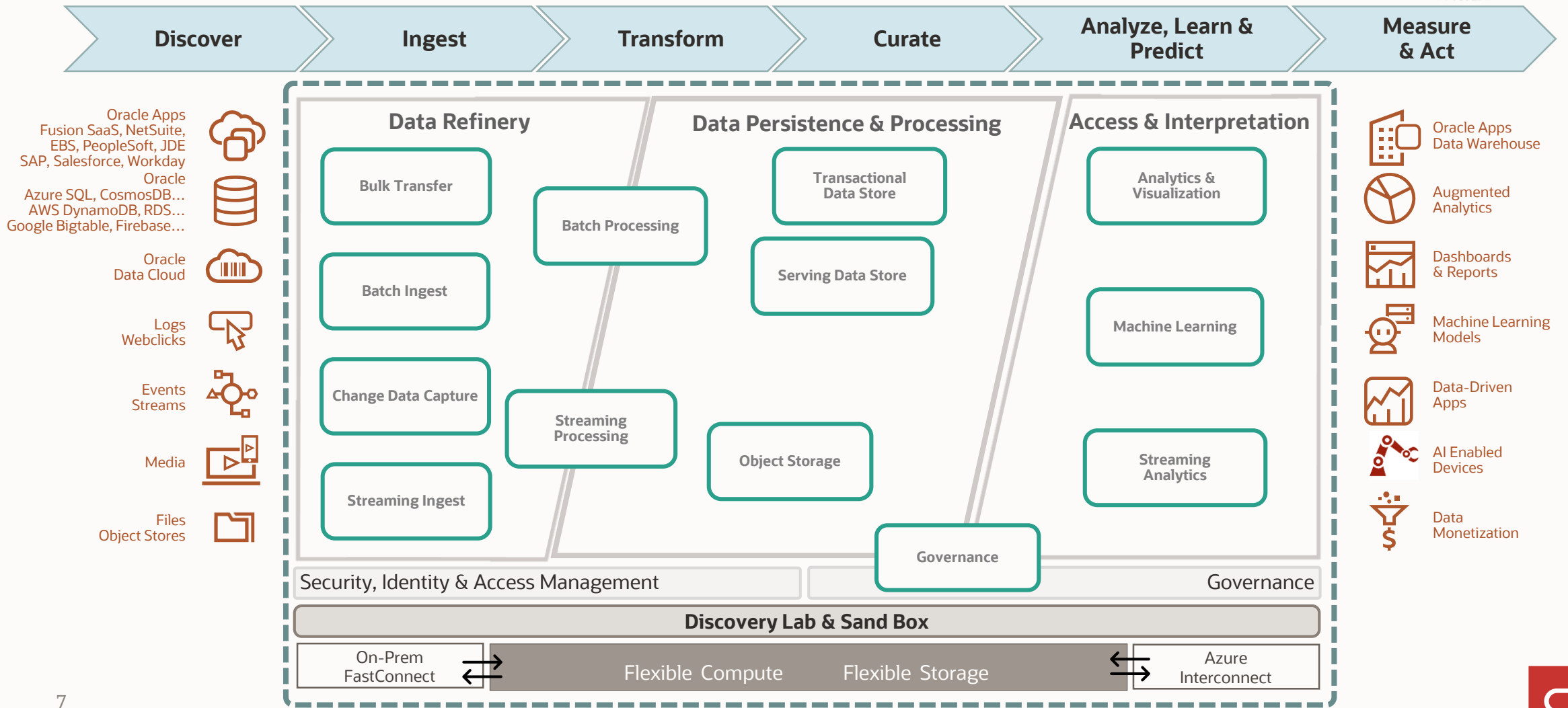FRANKFURT
ZURICH
FRANCE
ITALY
ISRAEL
SAUDI 2
JEDDAH
DUBAI
UAE 2
MUMBAI
HYDERABAD
CHUNCHEON
SEOUL
TOKYO
OSAKA

TORONTO
MONTREAL
SAN JOSE, CA
CHICAGO
PHOENIX
ASHBURN

SINGAPORE

VINHEDO
SAO PAULO

JOHANNESBURG

SANTIAGO

SYDNEY
MELBOURNE

Legend:
- Commercial
- Commercial Planned
- Government
- Government Planned
- Microsoft Interconnect Azure

Modern Data Warehouse

Reference Architecture and Patterns

Reference Architecture

Discover	Ingest	Transform	Curate	Analyze, Learn & Predict	Measure & Act

Discover (left column):
- Oracle Apps, Fusion SaaS, NetSuite, EBS, PeopleSoft, JDE, SAP, Salesforce, Workday
- Oracle, Azure SQL, CosmosDB… AWS DynamoDB, RDS… Google Bigtable, Firebase…
- Oracle Data Cloud
- Logs, Webclicks
- Events, Streams
- Media
- Files, Object Stores

Data Refinery

Data Persistence & Processing

Curated Information

Curated Data

Raw Data

Access & Interpretation

Measure & Act (right column):
- Oracle Apps Data Warehouse
- Augmented Analytics
- Dashboards & Reports
- Machine Learning Models
- Data-Driven Apps
- AI Enabled Devices
- Data Monetization

Security, Identity & Access Management

Governance

Discovery Lab & Sand Box

On-Prem FastConnect →← Flexible Compute   Flexible Storage ←→ Azure Interconnect

6

Capabilities Mapping

Discover	Ingest	Transform	Curate	Analyze, Learn & Predict	Measure & Act

Oracle Apps
Fusion SaaS, NetSuite,
EBS, PeopleSoft, JDE
SAP, Salesforce, Workday

Oracle
Azure SQL, CosmosDB…
AWS DynamoDB, RDS…
Google Bigtable, Firebase…

Oracle
Data Cloud

Logs
Webclicks

Events
Streams

Media

Files
Object Stores

Data Refinery

- Bulk Transfer
- Batch Ingest
- Change Data Capture
- Streaming Ingest

Batch Processing

Streaming Processing

Data Persistence & Processing

- Transactional Data Store
- Serving Data Store
- Object Storage

Access & Interpretation

- Analytics & Visualization
- Machine Learning
- Streaming Analytics

Governance

Security, Identity & Access Management   Governance

Discovery Lab & Sand Box

On-Prem FastConnect   Flexible Compute   Flexible Storage   Azure Interconnect

Oracle Apps
Data Warehouse

Augmented Analytics

Dashboards & Reports

Machine Learning Models

Data-Driven Apps

AI Enabled Devices

Data Monetization

Capability to Product Mapping

Cloud

Discover → Ingest → Transform → Curate → Analyze, Learn & Predict → Measure & Act

Left column inputs:
- Oracle Apps Fusion SaaS, NetSuite, EBS, PeopleSoft, JDE SAP, Salesforce, Workday
- Oracle Azure SQL, CosmosDB… AWS DynamoDB, RDS… Google Bigtable, Firebase…
- Oracle Data Cloud
- Logs Webclicks
- Events Streams
- Media
- Files Object Stores

Data Refinery

Bulk Transfer
(Fast Connect OCI Data Transfer OCI MFT, OCI CLI)

Batch Ingestion
(**OCI Data Integration**, ODI)

Change Data Capture
(GoldenGate or GG & ODI)

Streaming Ingest
(OCI Streaming Service, Kafka Connect)

Batch Processing
(**OCI Data Flow, OCI DI**, **Big Data Service,** ODI, PL/SQL)

Streaming Processing
(GG Streaming Analytics, **Big Data Service**)

Data Persistence & Processing

Transactional Data Store
(ATP, ExaCS, ExaC@C)

Serving Data Store
(ADW, ExaCS, ExaC@C)

Object Storage
(Object, File, Block)

Metadata Management
(**OCI Data Catalog**)

Access & Interpretation

Analytics & Visualization
(ISVs, Oracle Analytics Cloud)

Machine Learning
(**OCI Data Science, AI Services, OML**, OML Notebooks)

Streaming Analytics
(GG Streaming Analytics, BDS)

Security, Identity & Access Management

Governance

Discovery Lab & Sand Box

On-Prem FastConnect ⇄ Flexible Compute   Flexible Storage ⇄ Azure Interconnect

Right column outputs:
- Oracle Apps Data Warehouse
- Augmented Analytics
- Dashboards & Reports
- Machine Learning Models
- Data-Driven Apps
- AI Enabled Devices
- Data Monetization

The Modern Data Warehouse

Enabling rapid, actionable, data-driven outcomes

Discover	Ingest	Transform	Curate	Analyze, Learn & Predict	Measure & Act

Discover inputs:
- Oracle Apps Fusion SaaS, NetSuite, EBS, PeopleSoft, JDE SAP, Salesforce, Workday
- Oracle Azure SQL, CosmosDB… AWS DynamoDB, RDS… Google Bigtable, Firebase…
- Oracle Data Cloud
- Logs Webclicks
- Events Streams
- Media
- Files Object Stores

Data Refinery
- Data Engineering

Data Persistence Platform
- Department Data Warehouse
- Enterprise Data Warehouse
- Data Lake

Access & Interpretation
- Analytics
- Data Science

Measure & Act outputs:
- Oracle Apps Data Warehouse
- Augmented Analytics
- Dashboards & Reports
- Machine Learning Models
- Data-Driven Apps
- AI Enabled Devices
- Data Monetization

Security, Identity & Access Management | Governance

Discovery Lab & Sand Box

On-Prem FastConnect | Flexible Compute | Flexible Storage | Azure Interconnect

Big Data

Big Data Service

Data Flow

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Oracle Big Data Service

Secure, reliable, elastic Hadoop/Spark clusters

Native integration with Oracle Cloud Platform

Expand on-premises to Oracle Cloud
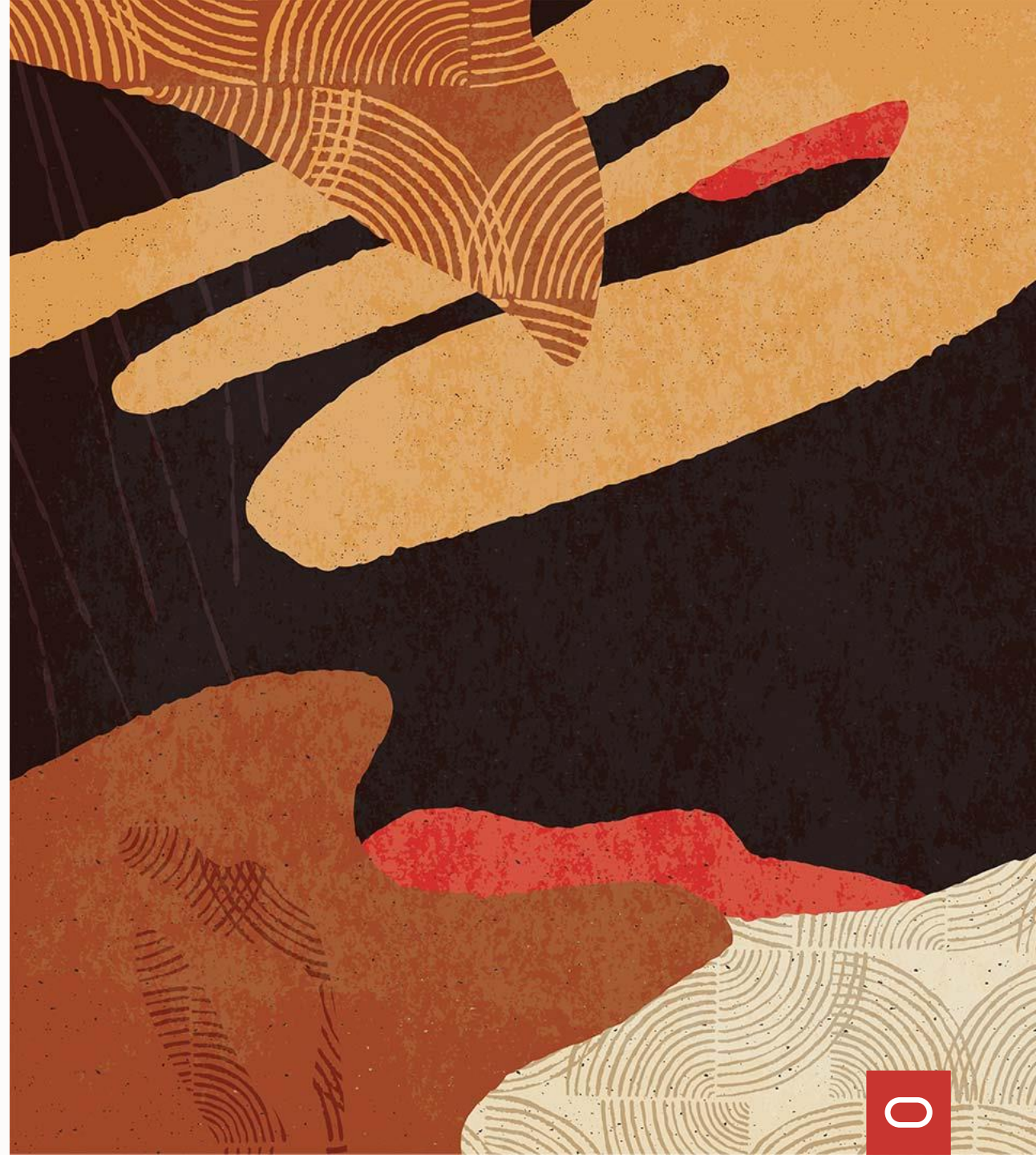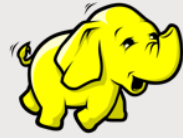
Data Management
Database – Data Lake - Access – Integration - Preparation

Infrastructure
CPU – GPU – Storage - Network

Most Complete Hadoop Platform

Use all of Cloudera Enterprise Data Hub

- Vertically integrated
- Spark, Kafka, Impala, Hive, Solr, etc.
- Security and management features automatically deployed

Cloudera Manager	
Hue	Oozie
Hive / Impala	Spark / Solr
YARN	Zookeeper
HDFS	HBase
Kafka / Sqoop	Flume
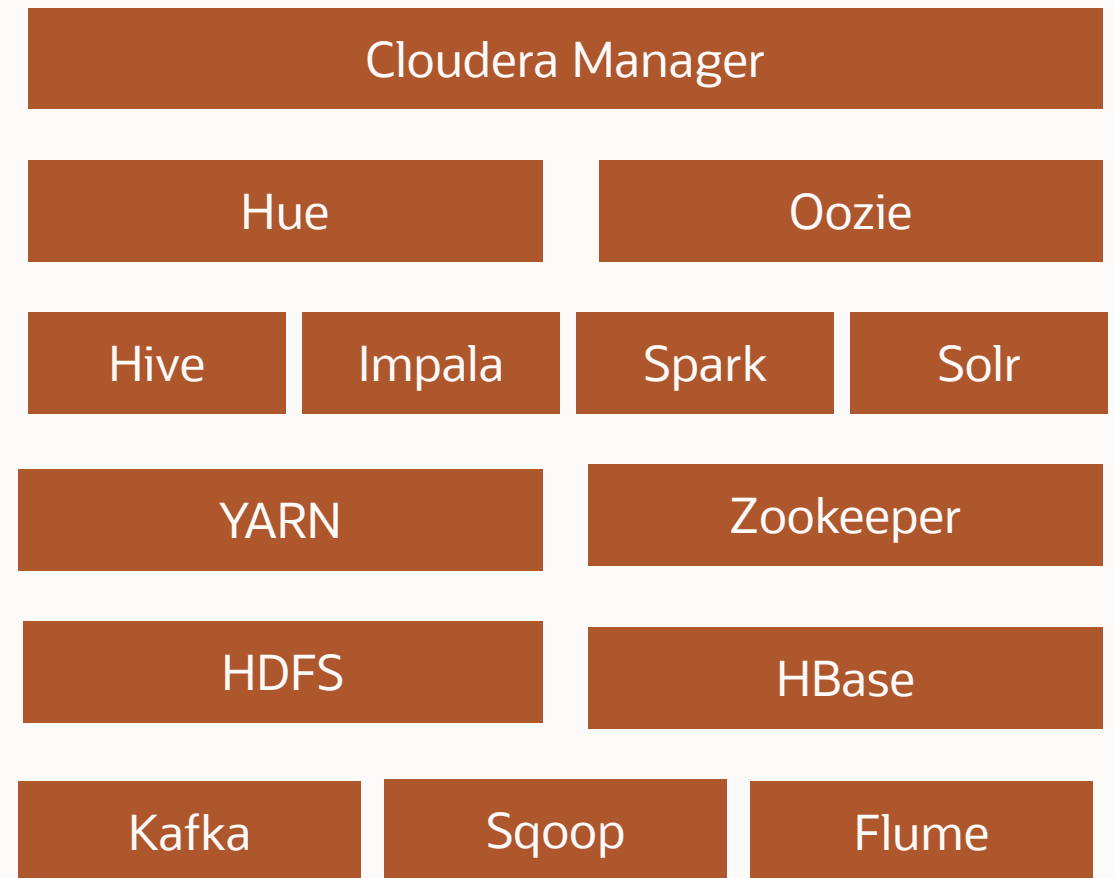
Sentry Authorization, Navigator Audit

Oracle Cloud Infrastructure Data Flow

Deliver Big Data and Machine Learning Apps Faster

Fully managed Spark service with near-zero administrative overhead.

Import/run existing Spark apps from EMR, Databricks, or Hadoop.

Pay-as-you-go, elastic big data service.

Diagram labels:
- Near-zero operations
- Consolidated Insight
- Cloud-native Security
- Simple troubleshooting
- Managed Output
- **Data Management** — Object Store - ADW - ATP - RDBMS - Spark Compatible Sources
- **Infrastructure** — CPU – GPU – Storage - Network
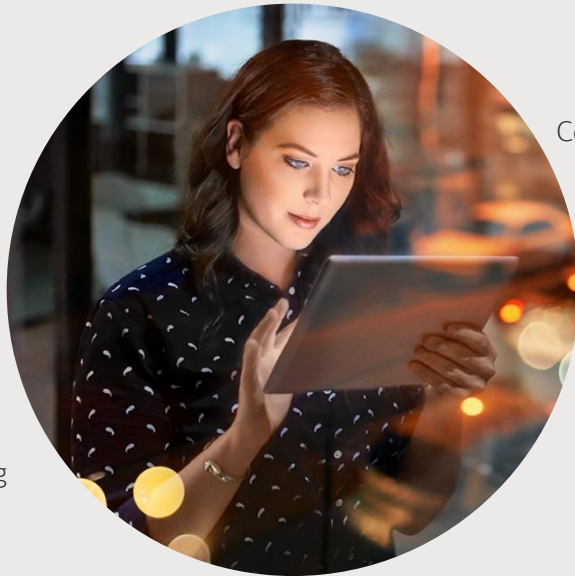
Limited Availability 1H 2021
Data Flow Interactive SQL: Unstructured Analytics for Petabyte Scale

Data Flow Interactive SQL

SQL Processor

Worker | Worker | Worker | Worker
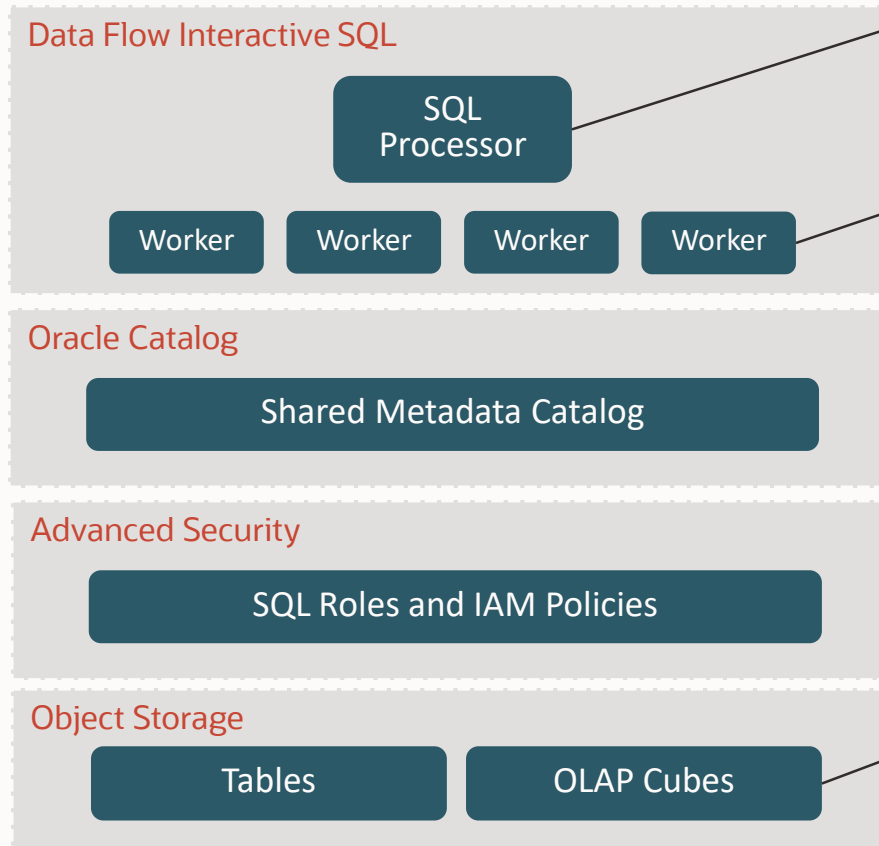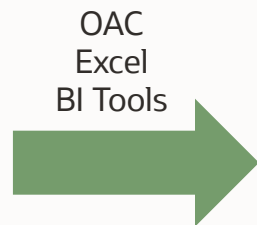
Spark SQL Query through ODBC, JDBC or Python.

Scale to 1,000s of cores instantly on commodity hardware.

Oracle Catalog

Shared Metadata Catalog

Common metadata across Batch and Interactive clusters.

Advanced Security

SQL Roles and IAM Policies

Granular security to the column level.

Object Storage

Tables | OLAP Cubes

OLAP Cubes for up to 100x faster performance.

Object Storage for unlimited scale at low price.

BI Professionals

OAC
Excel
BI Tools

Data Scientists

Notebook

AI / ML

OCI Data Science Service

OCI AI Services

Oracle SaaS Applications

Oracle Digital Assistant

Oracle Machine Learning

Oracle Analytics Cloud

Oracle's Approach and Strategy
AI/ML in Database, Cloud Services, Analytics, and Applications

Data Sources

Batch

Ingest/prep

Streaming

Real-time Analytics

Database & Data Lake

Catalog & Visualize

Data Science & Machine Learning

consume

Applications

Business Analytics

Cloud Infrastructure

Compute

Networking

Storage

Security

Cloud Native
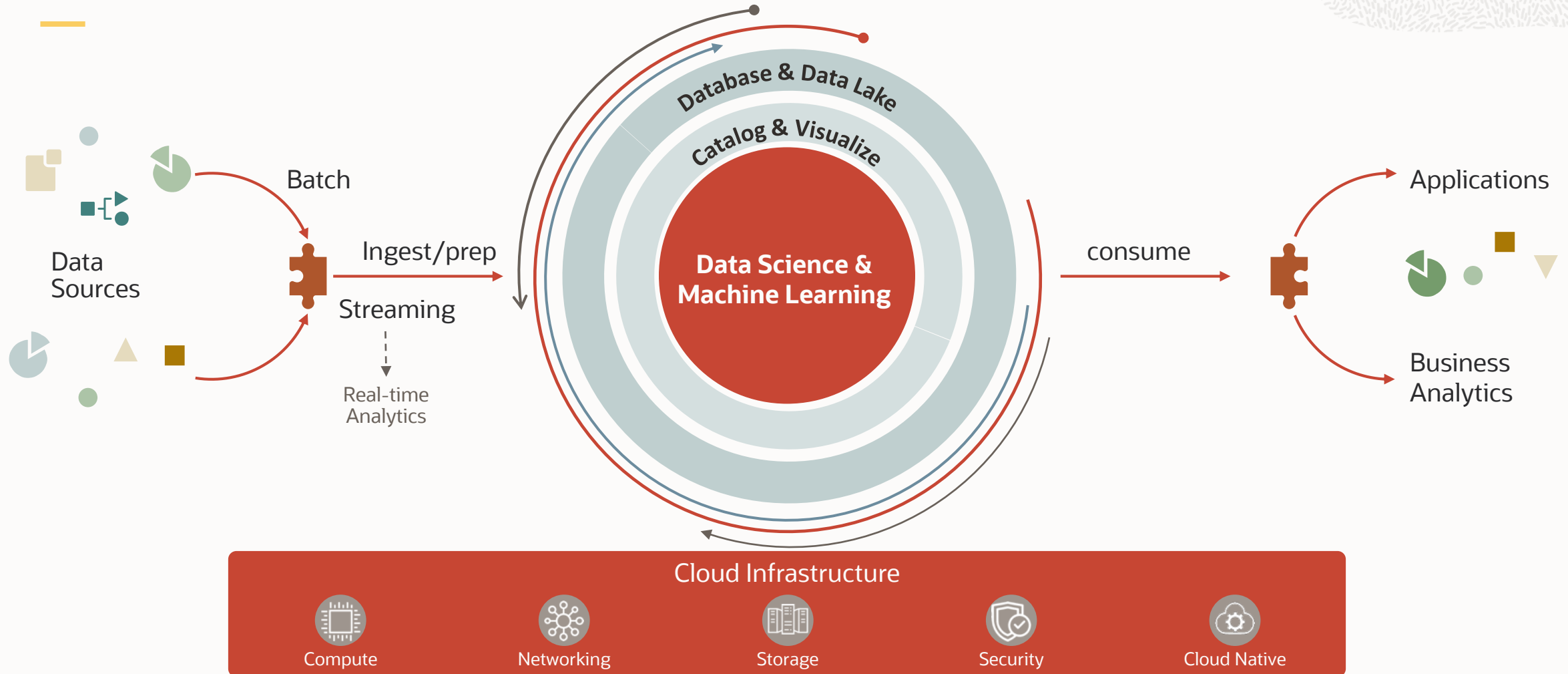
Our Differentiation

We've built a unified AI/ML platform that enables systems of intelligence across developers, data scientists, analysts, and business users

- People in different roles can easily collaborate on AI/ML outcomes
- E.g. Developer and Data Scientist can prepare and use the same data to build models using an AI service or a data science notebook and python

We're applying that platform to each of our products including Oracle's SaaS apps layer – Fusion, Netsuite, GBUs, etc. that enables sharing across them

- This means each Oracle application and service gets better with use
  - E.g. customer service management app can automatically classify incoming support requests to the specific product team, based on AI language models that were trained on the specific list of products from Oracle's ERP Cloud.
- It also means you can easily extend the applications
  - E.g. Combine app data with other signals to create better predictions

How it works

Introducing the Intelligence Store

- Problem
  - "80% of data science is data prep…"
  - Artifacts are not easily shared from one team/product/service to the next, often due to the lack of discovery, governance, and integration

- Solution
  - Formalize the ability to store, discover, understand, and consume ML artifacts
    - Includes support for ML models, embeddings, vectors, and other representations commonly used for model building and training
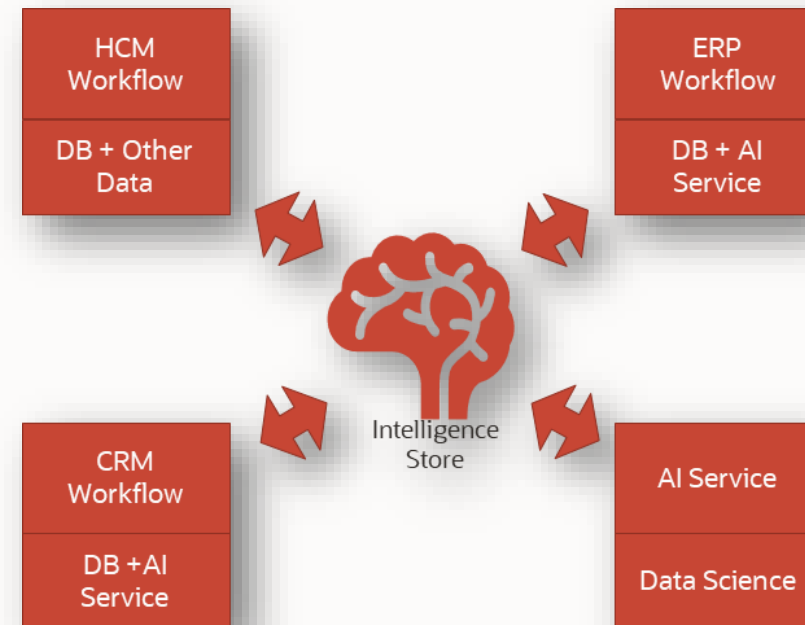
Intelligence Sharing across the Platform

Oracle SaaS Applications, Analytics

Other Applications

AI Services

Data Science Service, Oracle ML

Shared Intelligence Store
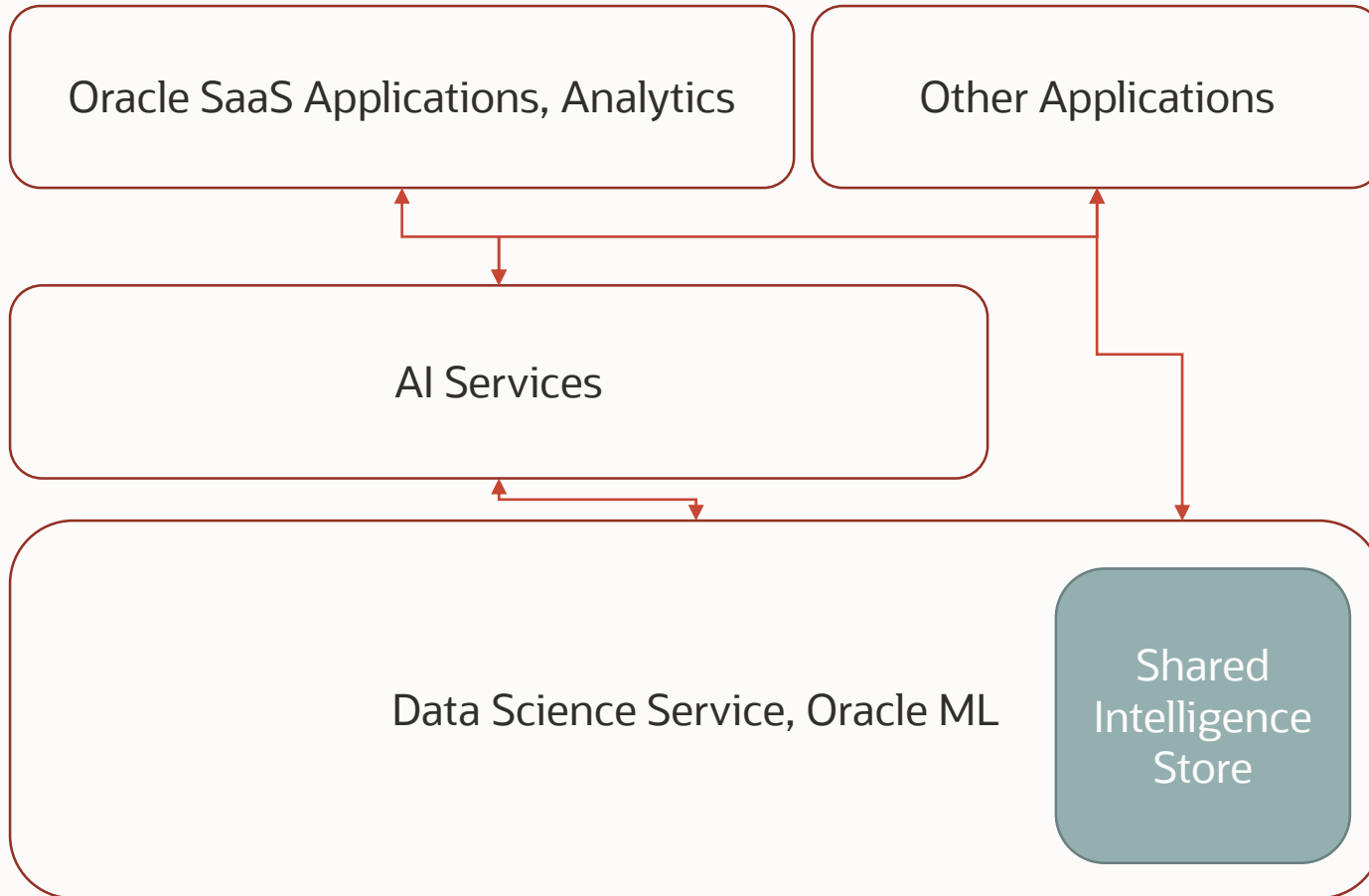
- Intelligence store serves as central location for "ML artifacts"
- Analysts and Business users participate via applications and analytics
- Developers, and DBAs participate via AI services and OML
- Data Scientists participate via Data Science Service

Products and Services

Oracle AI Applications

COMPANY AND TRUSTED DATA

Ready-to-Go
Company and Trusted Data
Oracle Modern Cloud

CONNECTED INTELLIGENCE
Only Oracle Connects Outcomes Across Pillars
for Even Smarter Business Results

AI   Machine
                                  Learning

Connected
Intelligence

Next Best Offers   Intelligent   Predictive   Best Fit
and Actions   Payments   Throughput   Candidates

CX   ERP   SCM   HCM
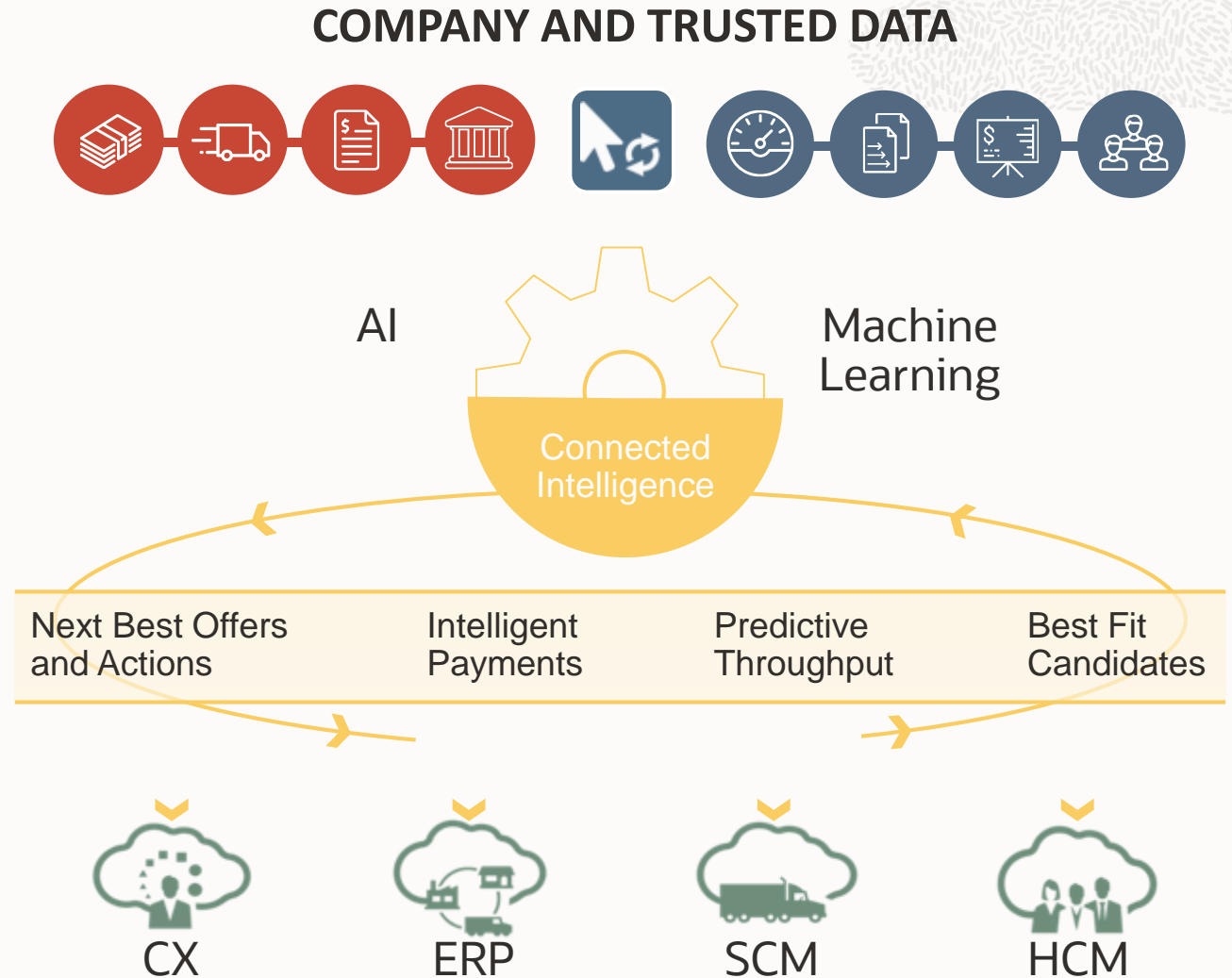
OCI AI Services

Language
Easily add language processing capabilities to solve common enterprise needs

Speech
Support for speech transcription, text to speech, translation, recognition

Vision
Document and form understanding, OCR, object detection, classification

Decision
Anomaly detection, fraud detection, next best action

Oracle Cloud Infrastructure Data Science

Support for Python and open source

Accelerated

Allow data scientists to work the way they want to, and provide access to automated workflows, the best of open source, and a streamlined approach to building models.

Collaborative

Enable data science teams to work together with ways to share and reproduce models in a structured, secure way for enterprise-grade results.

Enterprise-Grade

Provide a fully managed platform built to meet the needs of the modern enterprise
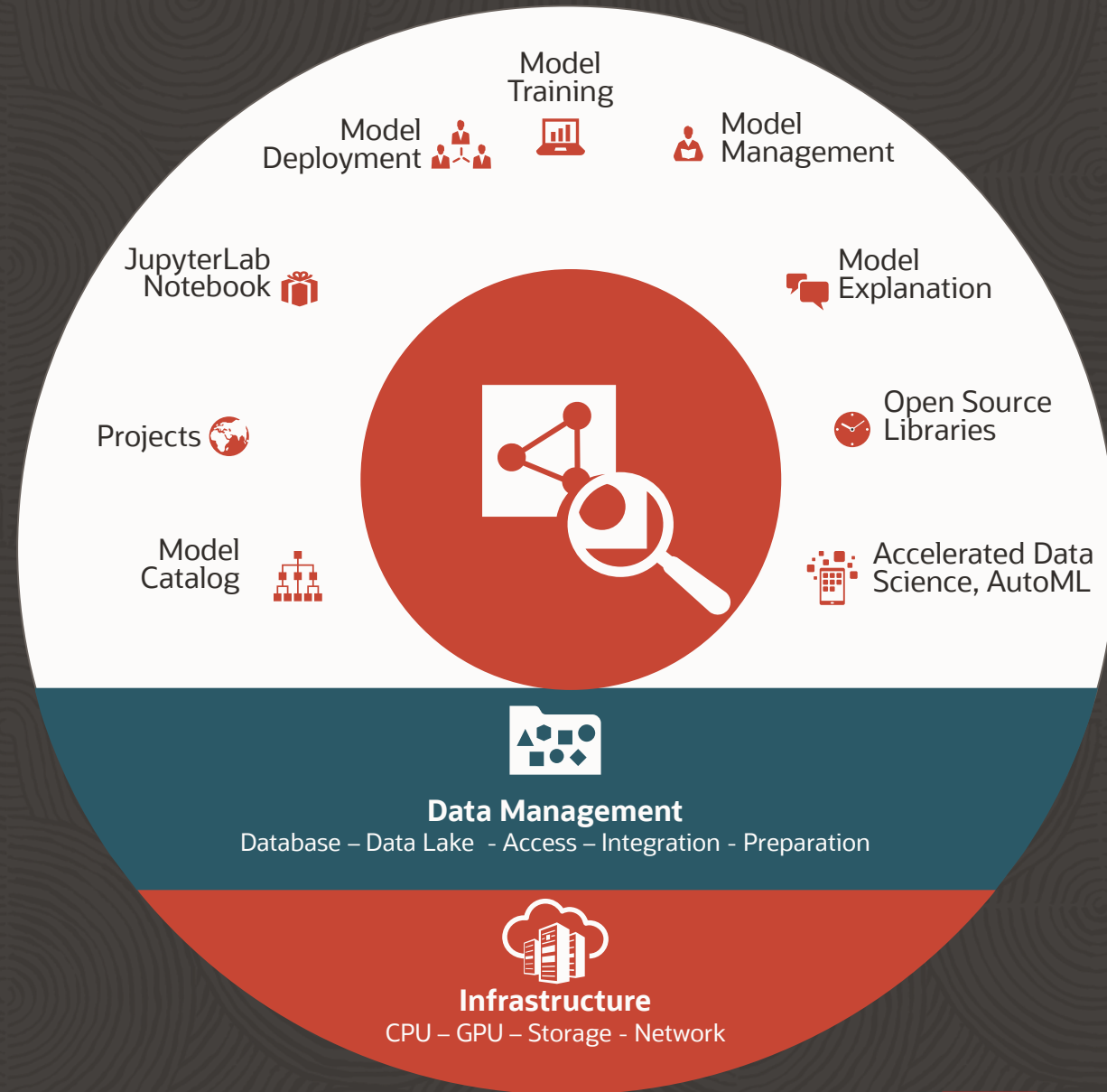
Oracle Machine Learning

In-database machine learning

Automated

Available support for SQL, R and Python

Automated data preparation

Scalable

30+ high performance, parallelized in-database machine learning algorithms that require no data movement

Production-ready

Quickly deploy and update machine learning models in production databases, or via REST APIs

Attribute importance

Association rules

Regression

SQL analytics

Classification

Feature extraction

Predictive queries

Clustering

Anomaly detection

Statistical functions

Time series

Text mining
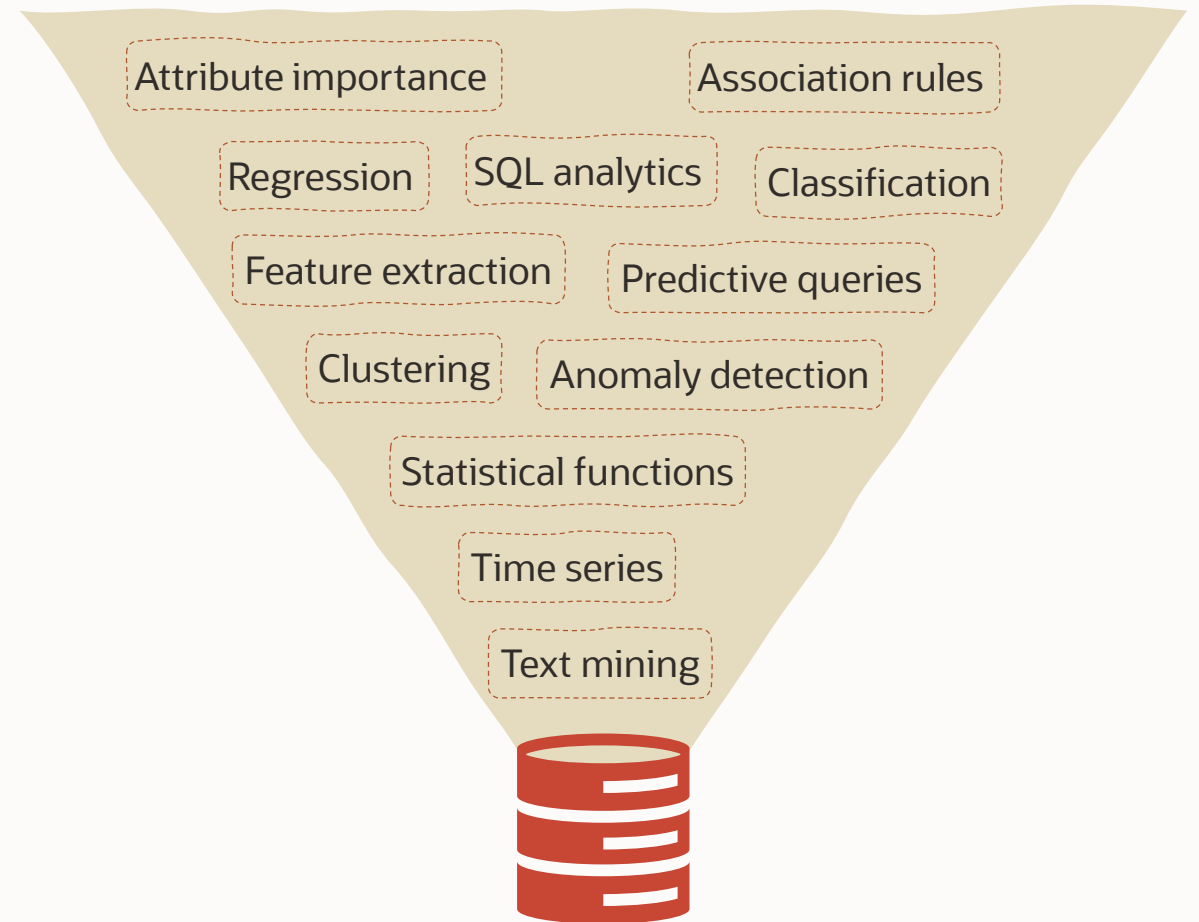
Oracle Analytics Cloud

Collaborate with business analysts

Data visualization and exploration

Enable business analysts to develop insight on business problems via data and communicate clearly with data scientists.

Data preparation

Build workflows to clean and prepare data for modeling

Descriptive and prescriptive analytics

Enable business analysts to build and prototype models to improve communication and understanding.
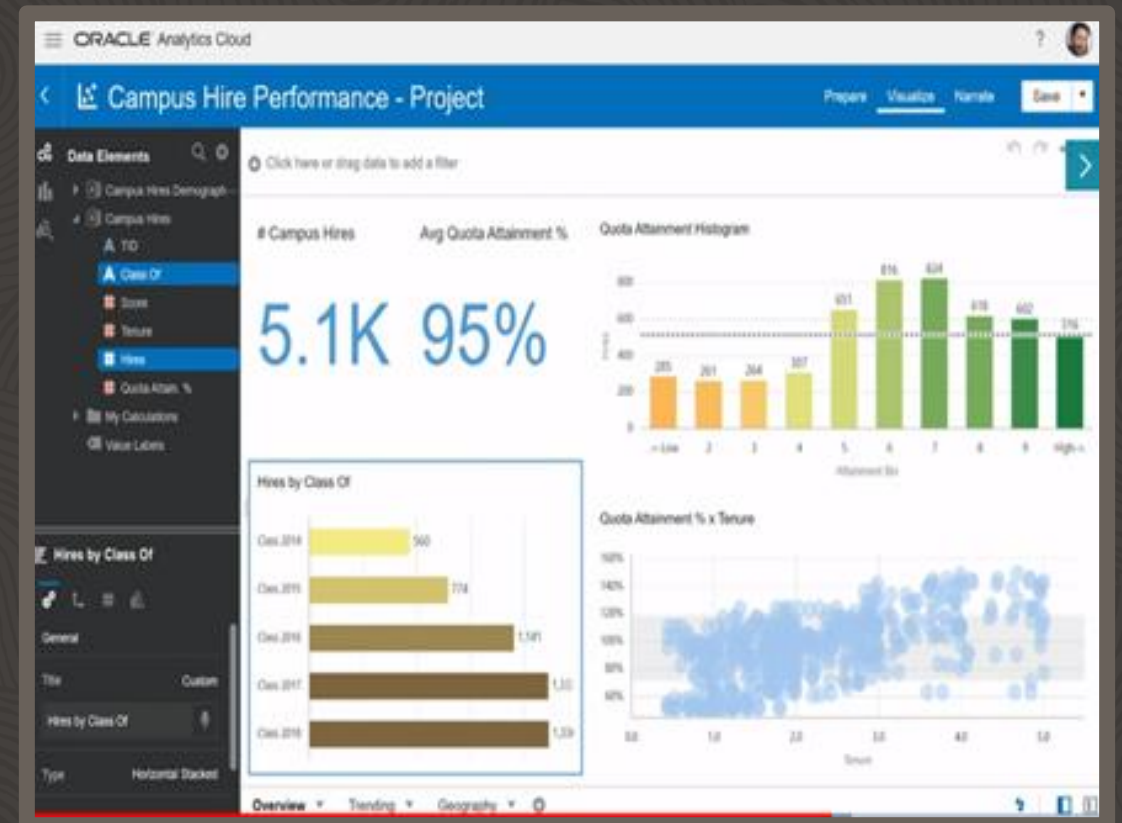
What's Next?

Roadmap

- AI Services – More coming…
  - Vision, speech, language, and decision
  - Vertical (healthcare, manufacture, etc.)
  - Horizontal (Contact center, cognitive search, etc.)
- SaaS application integration
  - Oracle SaaS horizontal (ERP, HCM, etc.), vertical (Finance, energy, etc.)
- Orchestration across Dev Ops and AI Ops – Data and ML lifecycle
  - Seamless experiences across data ingestion, data preparation, model development, training, deployment, monitoring

Join the Data & AI Beta Program!

Get early access to the new features in OCI Data & AI Services

Our Beta Program in a nutshell

- A one-time signup process gives you access to all the beta features for OCI Data Science, Data Flow, Data Integration, and Data Catalog services.

- Opt into any or all the features you want early access.

- Meet with the product managers and give them your feedback!

Current Beta Programs:

Beta Program	Description	Timeline	Who to Contact
Data Science Model Deployment	Model Deployment gives data scientists the ability to easily deploy models as HTTP endpoints directly from the model catalog.	Now - March 19, 2021	jr.gauthier@oracle.com
Data Integration Pipeline Orchestration	Scheduling and orchestration of data loader and data integration tasks	Now – March 31, 2021	sandrine.ost@oracle.com julien.testut@oracle.com