Get Started with Data Engineering on Databricks

We will start at 3 minutes past the starting time...

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Meet your instructor

Venkita Krishnan Mani, Technical Instructor

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Now

- Technical Instructor

Then

- Big Data & Spark Consultant
  - – JPMC / Citi Bank / Deutsche Bank / Zarantec
- Hadoop Practice Lead –
  - - Nichetek / Collabera India / CavalierIT

Interests

- Consulting / Teaching & Mentoring

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Get Started with Data Engineering on Databricks

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Session topics

- Databricks Lakehouse Platform overview
- Databricks Architecture and Services
- Data Science and Engineering Workspace feature dive/demos:
  - UI tour
  - Creating and configuring clusters
  - Developing code with Databricks Notebooks
  - Git versioning with Databricks Repos
- Managing Data with Delta Lake
  - Delta Lake overview
  - Setting up, versioning, and optimizing Delta tables
  - Loading data into Delta Lake

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Databricks Lakehouse Platform Overview

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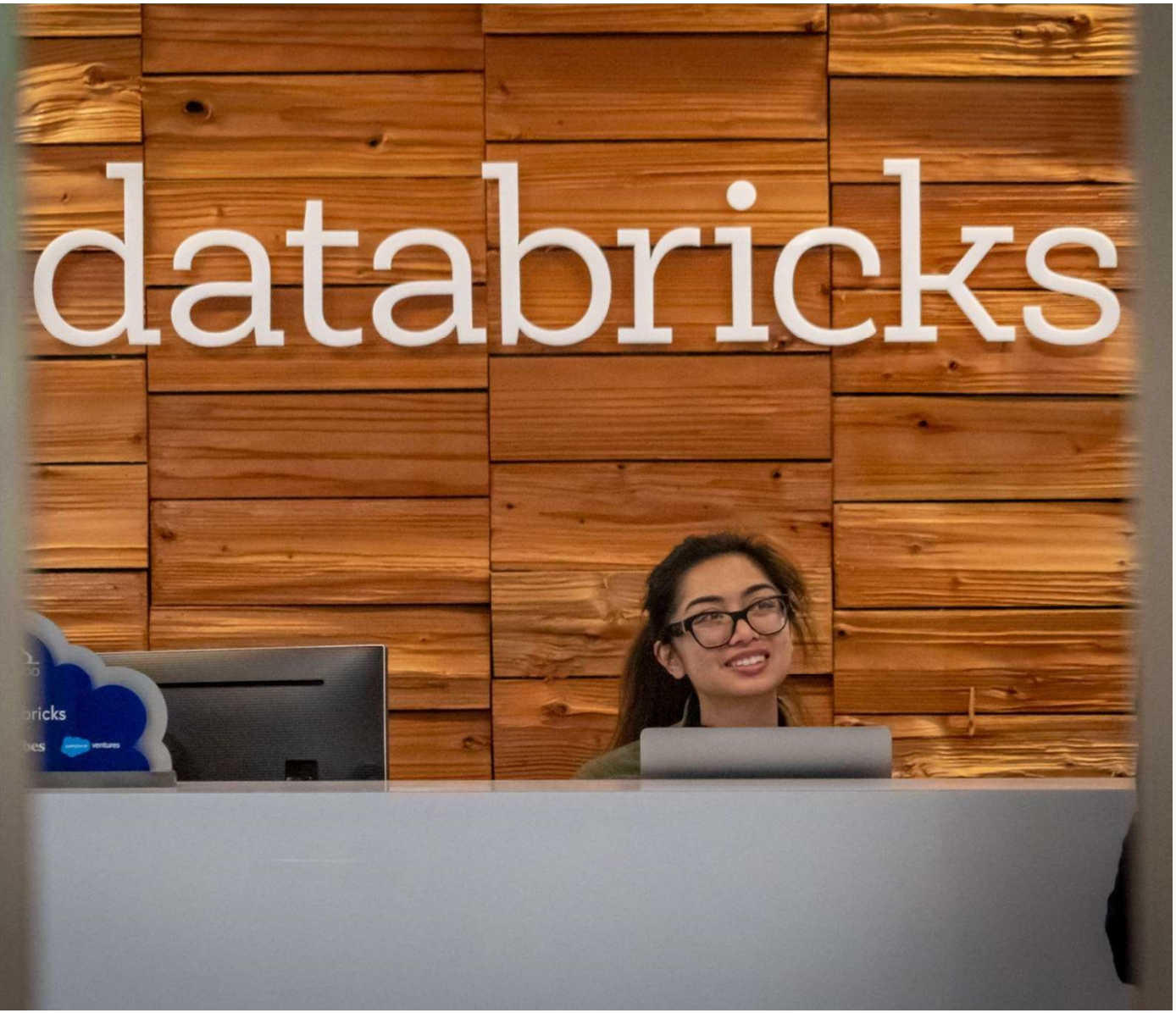
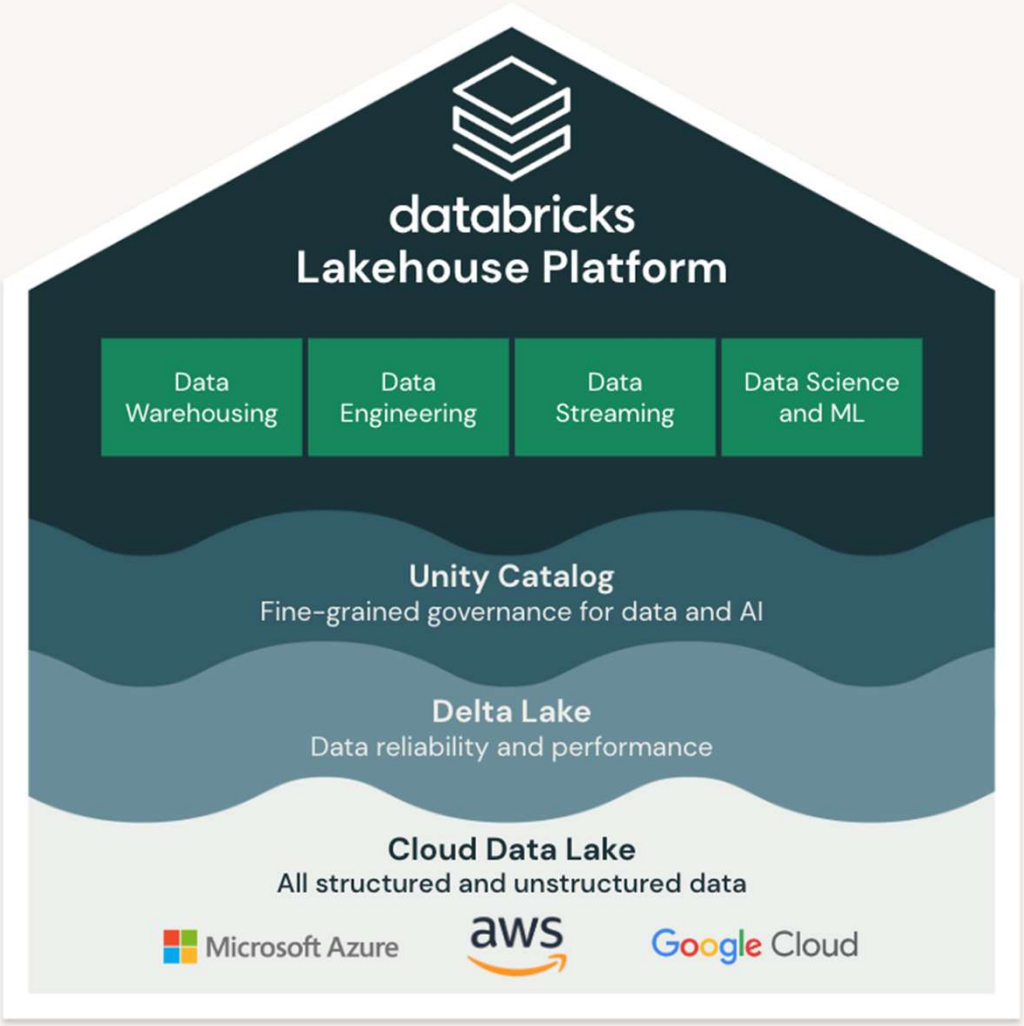


APACHE Spark™

DELTA LAKE

mlflow™



Databricks Lakehouse Platform

Simple

Unify your data warehousing and AI use cases on a single platform

Open

Built on open source and open standards

Multicloud

One consistent data platform across clouds

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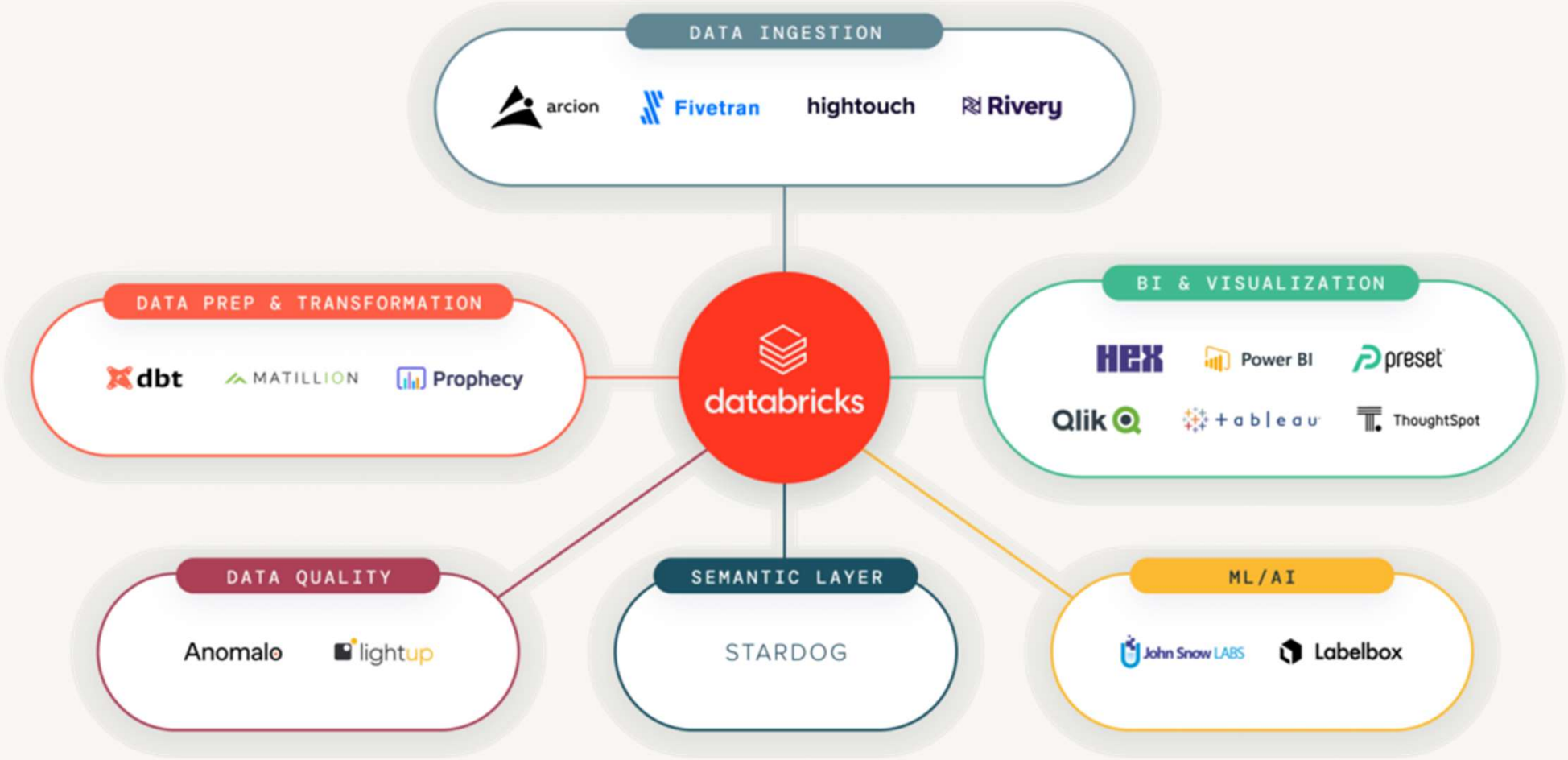

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Databricks Workspace and Services

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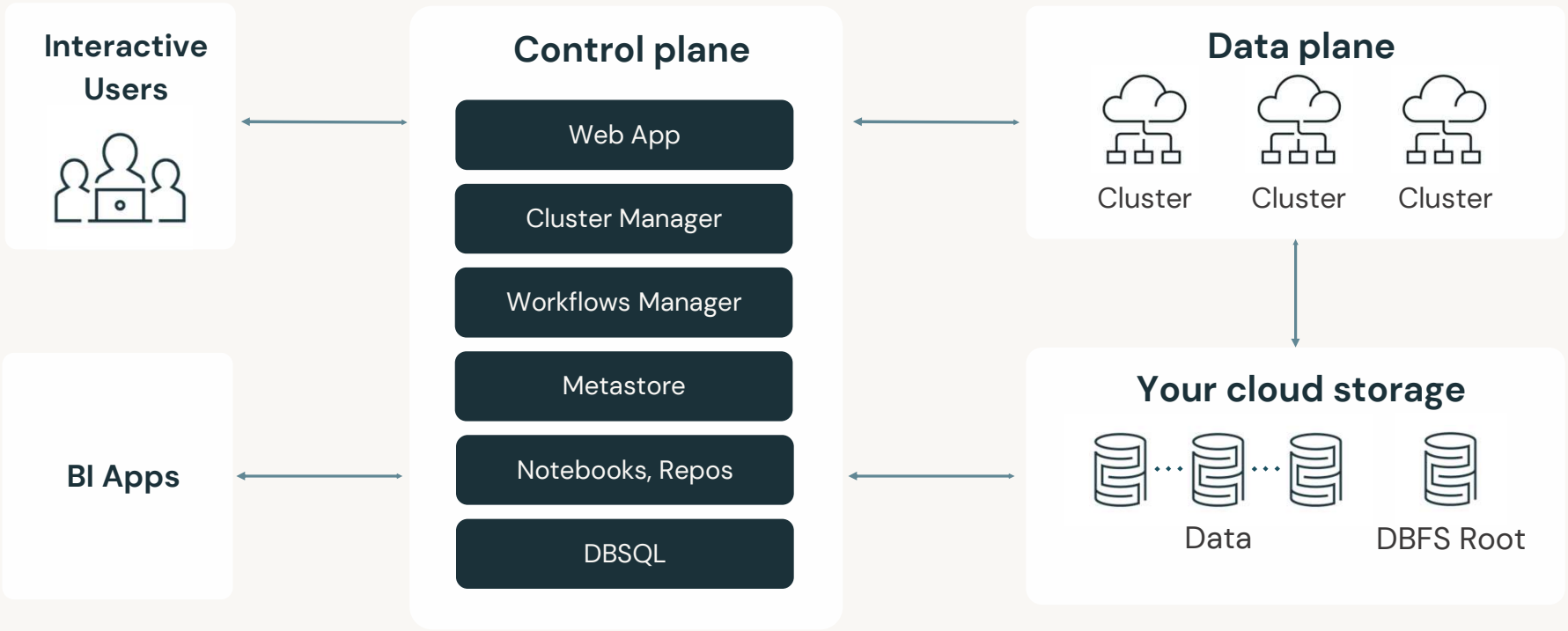
Databricks architecture



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Demo: Navigate the Workspace UI

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Compute Resources

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Clusters

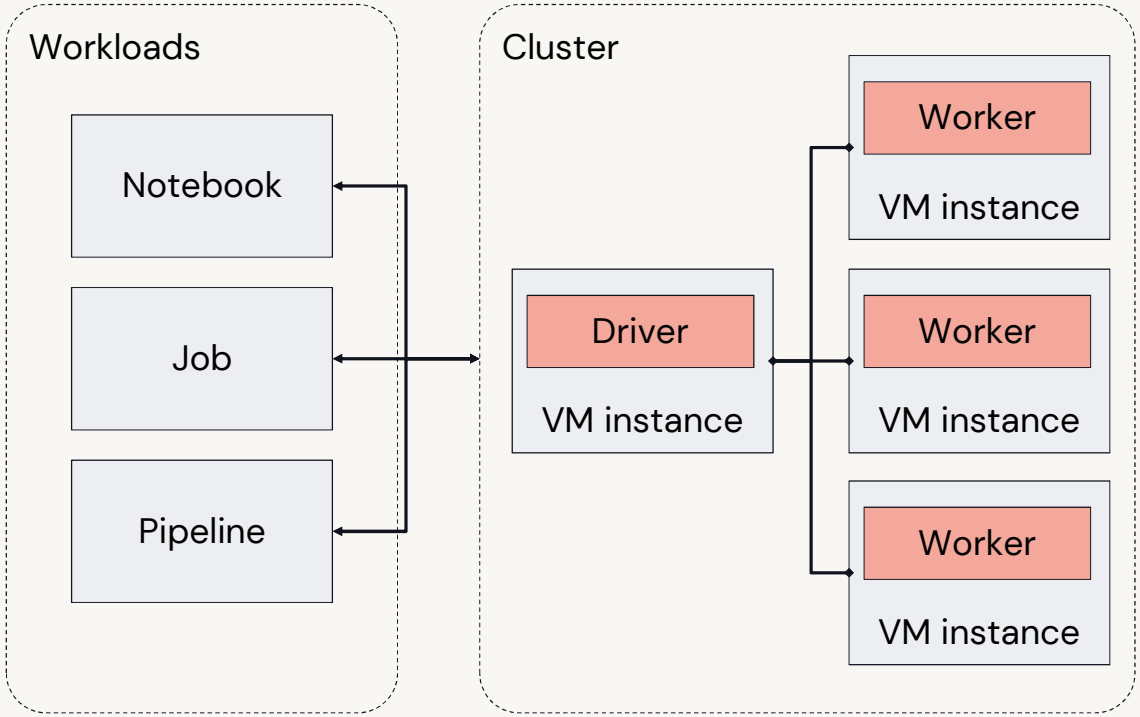
Overview

Collection of VM instances

Distributes workloads across workers

Two main types:

1. **All-purpose** clusters for interactive development
2. **Job** clusters for automating workloads



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Cluster Types

All-purpose Clusters

Analyze data collaboratively using **interactive** notebooks

Create clusters from the Workspace or API

Configuration information retained for up to 70 clusters for up to 30 days

Job Clusters

Run **automated** jobs

The Databricks job scheduler creates job clusters when running jobs

Configuration information retained for up to 30 most recently terminated clusters

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Cluster Configuration

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Cluster Mode

Standard

Default mode for workloads developed in any supported language (requires at least two VM instances)

Single node

Low-cost single-instance cluster catering to single-node machine learning workloads and lightweight exploratory analysis

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Databricks Runtime Version

Standard

Apache Spark and many other components and updates to provide an optimized big data analytics experiences

Photon

An optional add-on to optimize SQL workloads

Machine learning

Adds popular machine learning libraries like TensorFlow, Keras, PyTorch, and XGBoost.

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Cluster Policies

Cluster policies can help to achieve the following:

- Standardize cluster configurations
- Provide predefined configurations targeting specific use cases
- Simplify the user experience
- Prevent excessive use and control cost
- Enforce correct tagging

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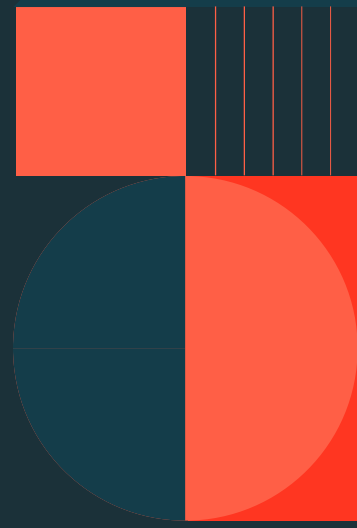
Demo: Create and manage interactive clusters



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Develop Code with Notebooks & Databricks Repos

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Notebook magic commands

Use to override default languages, run utilities/auxiliary commands, etc.

%python, %r, %scala, %sql	Switch languages in a command cell
%sh	Run shell code (runs only on Spark Driver, and not the Workers)
%fs	Shortcut for dbutils filesystem commands
%md	Markdown for styling the display
%run	Execute a remote Notebook from a Notebook
%pip	Install new Python libraries

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`dbutils` (Databricks Utilities)

Perform various tasks with Databricks using notebooks

Utility	Description	Example
`fs`	Manipulates the Databricks filesystem (DBFS) from the console	`dbutils.fs.ls()`
`secrets`	Provides utilities for leveraging secrets within notebooks	`dbutils.secrets.get()`
`notebook`	Utilities for the control flow of a notebook	`dbutils.notebook.run()`
`widgets`	Methods to create and get bound value of input widgets inside notebooks	`dbutils.widget.text()`
`jobs`	Utilities for leveraging jobs features	`dbutils.jobs.taskValues.set()`

Available within Python, R, or Scala notebooks

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Demo: Databricks Notebook Operations

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What is Delta Lake?

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Delta Lake is an open-source project that enables building a data lakehouse on top of existing storage systems

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Delta Lake Is Not...

- Proprietary technology
- Storage format
- Storage medium
- Database service or data warehouse

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Delta Lake Is...

- Open source
- Builds upon standard data formats
- Optimized for cloud object storage
- Built for scalable metadata handling

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Delta Lake brings ACID to object storage

- **A**tomicity
- **C**onsistency
- **I**solation
- **D**urability

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Problems solved by ACID

1. Hard to append data
2. Modification of existing data difficult
3. Jobs failing mid way
4. Real-time operations hard
5. Costly to keep historical data versions

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Delta Lake is the default for all tables created in Databricks

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Demo: Version and Optimize Delta Tables

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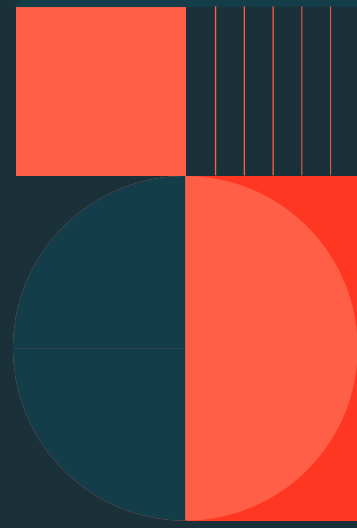
Demo: Load Data into Delta Lake



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Questions?

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