

DATA+AI SUMMIT

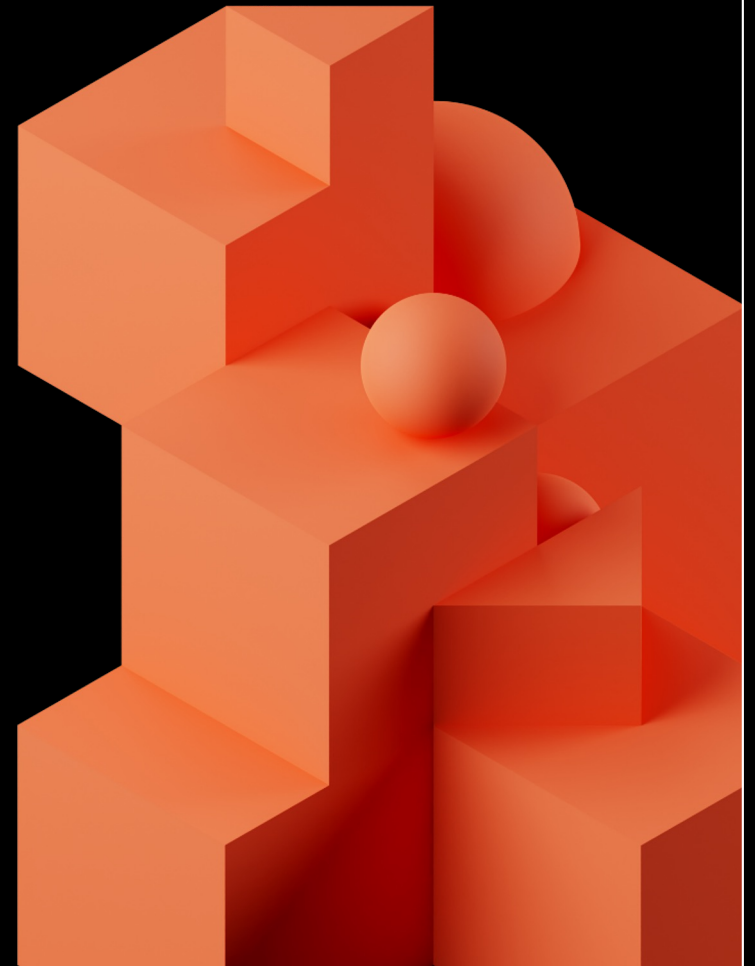
BY  databricks

Real-time building occupancy modelling

Using DLT and Cisco Spaces Meta
API

Chris Inkpen
Solutions Architect
Honeywell HBT

Paul Mracek
Solutions Architect
Databricks



Honeywell



AEROSPACE

More fuel-efficient aircraft.
More direct and on-time flights.
Safer skies and airports. We're
found on virtually every
commercial, defense and space
aircraft.



BUILDING TECHNOLOGIES

Over 100 years ago, we defined
energy efficiency by making
indoor comfort automatic.
Today, we redefine it in 10
million buildings using our
technology.



PERFORMANCE MATERIALS & TECHNOLOGIES


We pioneered automation
control so we understand
complex industrial facilities and
how to create high-quality and
high-performance chemicals
and materials.



SAFETY & PRODUCTIVITY SOLUTIONS

Each year, we keep over half a
billion workers safer and more
productive with voice-enabled
software, barcode scanners,
mobile computers and
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LAKEHOUSE PRODUCT SPOTLIGHT: DELTA LIVE TABLES

Honeywell selects Delta Live Tables for streaming data



Honeywell

INDUSTRY: Manufacturing
PLATFORM USE CASE: Lakehouse, Delta Lake, Delta Live Tables
CLOUD: Azure

“Databricks helps us pull together many different data sources, do aggregations, and bring the significant amount of data we collect from our buildings under control so we can provide customers value.”

— Dr. Chris Inkpen, Global Solutions Architect, Honeywell Energy and Environmental Solutions

Companies are under growing pressure to reduce energy use, while at the same time they are looking to lower costs and improve efficiency. Honeywell delivers industry-specific solutions that include aerospace products and services, control technologies for buildings and industry, and performance materials globally. Honeywell’s Energy and Environmental Solutions division uses IoT sensors and other technologies to help businesses worldwide manage energy demand, reduce energy consumption and carbon emissions, optimize indoor air quality, and



Experimenting
with
occupancy
during e
COVID d

HACKATHON DEC 2020 DEMO

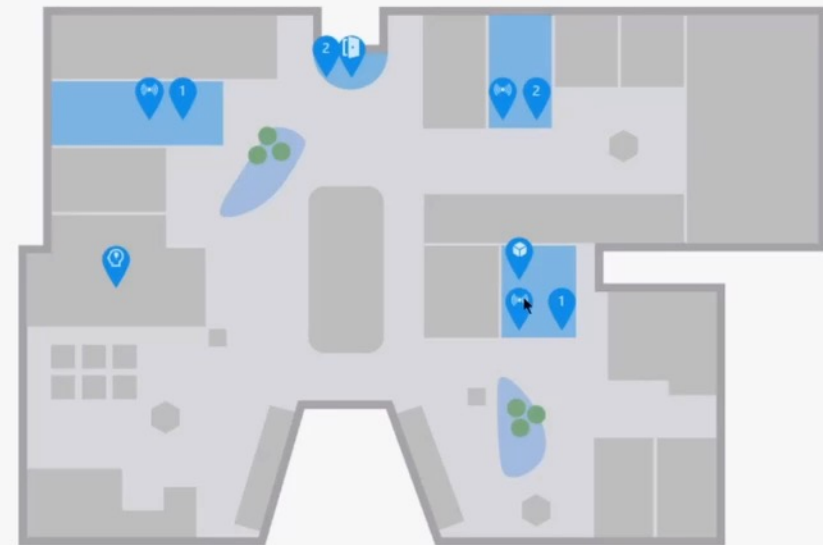
- **Main Features**

- Devices appear and disappear as found
- Colour coded People Count in each room
- AI Insights generated and displayed real-time in different areas



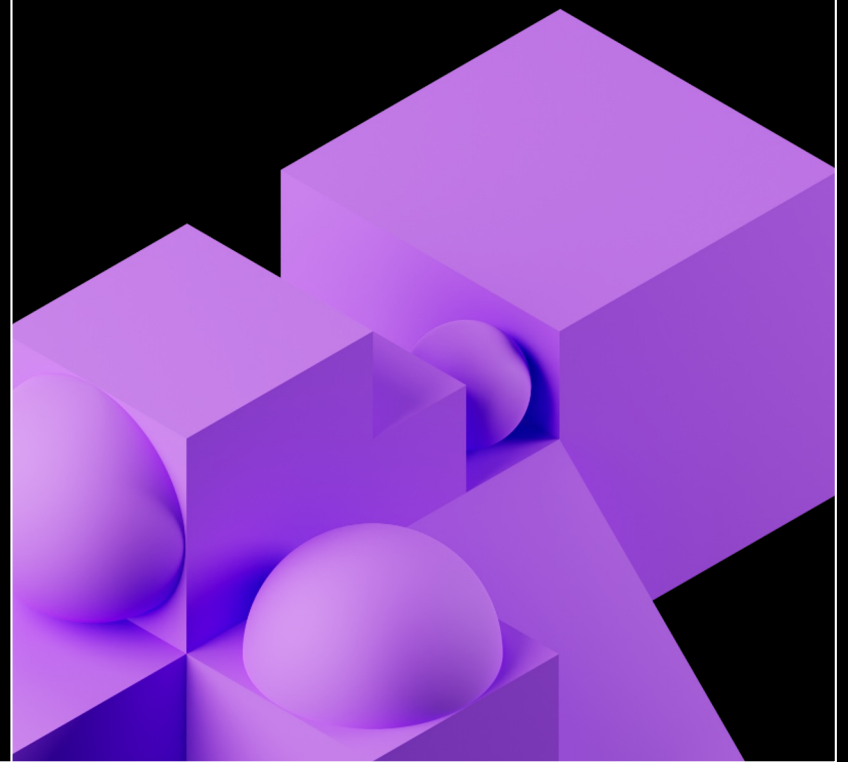
Honeywell

Enhanced Occupancy Sensing



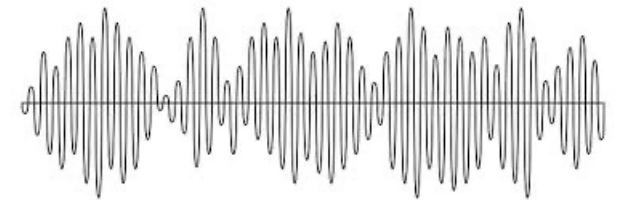
Inkpen, Chris

Occupancy in buildings



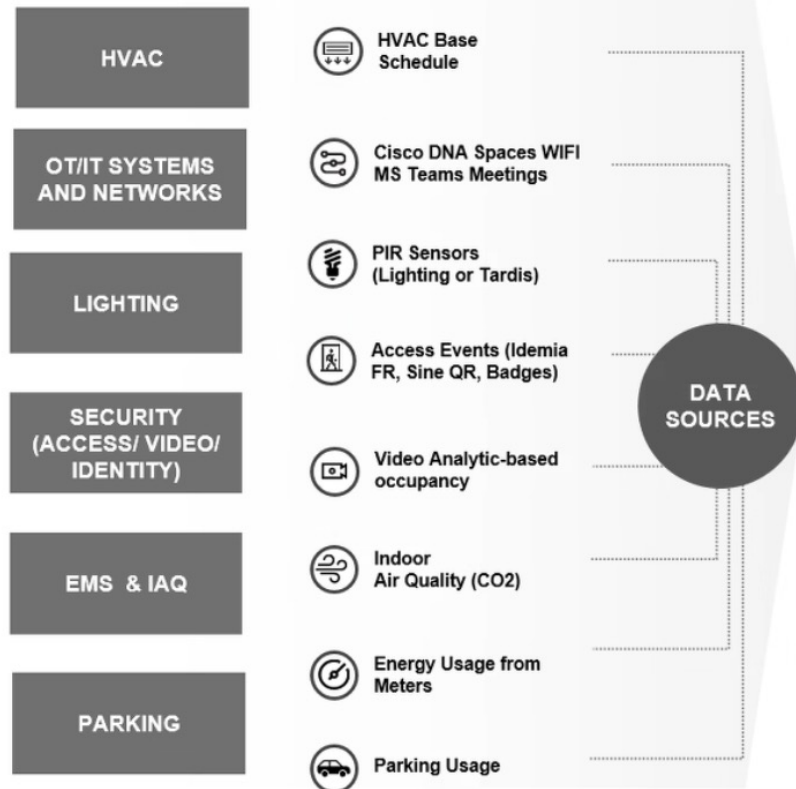
Occupancy measurements

- Cameras
- Passive Infrared
- Active Infrared Break-beam
- WiFi Tracking
- Seat Sensors
- Ultrasonic
- Microwave
- Audio
- Connected Power
- Thermal
- CO2



ENABLING OCCUPANCY BASED OUTCOMES...

ENABLING ARCHITECTURE



FORGE DATA PIPELINE: IBO LIVE OCCUPANCY PREDICTION ALGORITHM

Existence of multiple systems

Weightage of system accuracy

KEY OUTCOMES



FACILITY MANAGEMENT OPTIMIZATION



NOTIFICATION & EVACUATION



IMPROVED IAQ RESPONSE



REDUCTION OF ENERGY USE IN LOW OCCUPANCY PERIODS



OPTIMAL SELECTION AND TIMING OF ENERGY SOURCES TO REDUCE CARBON

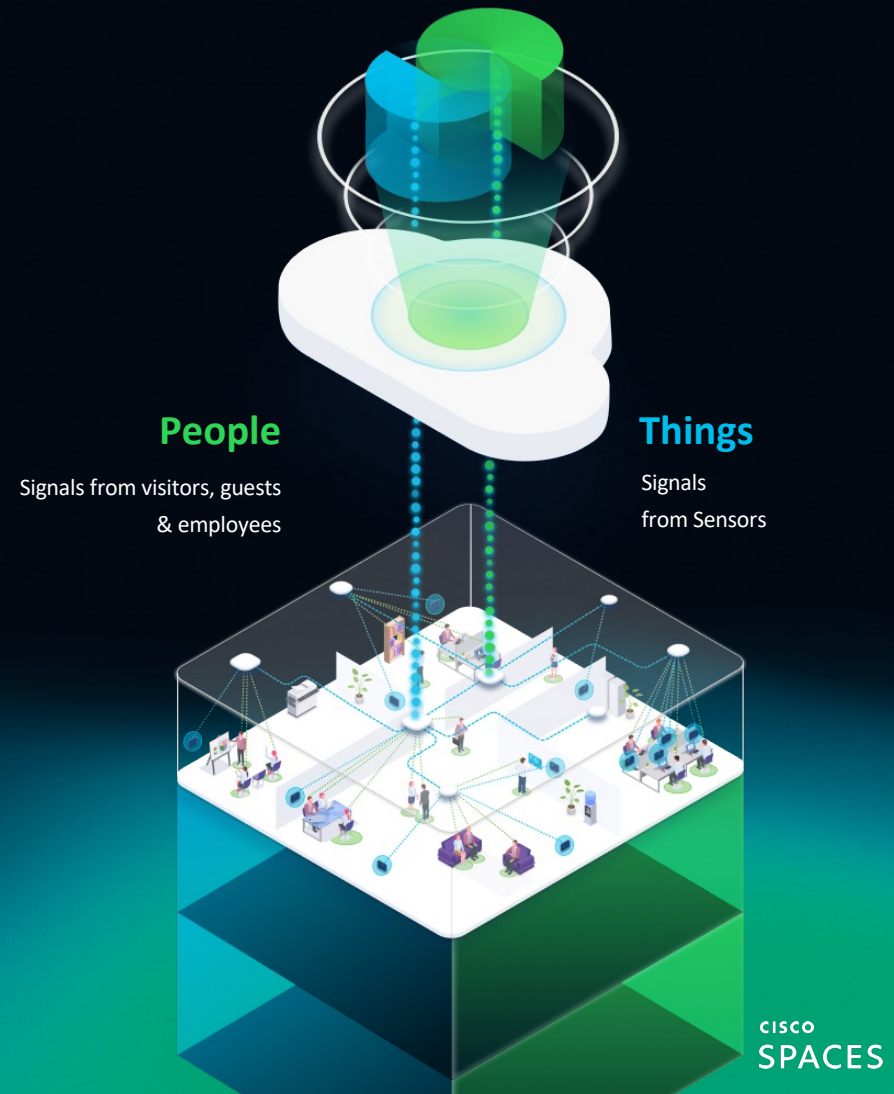
Engaging customers to validate outcomes to prioritize enabling architecture!

CISCO SPACES

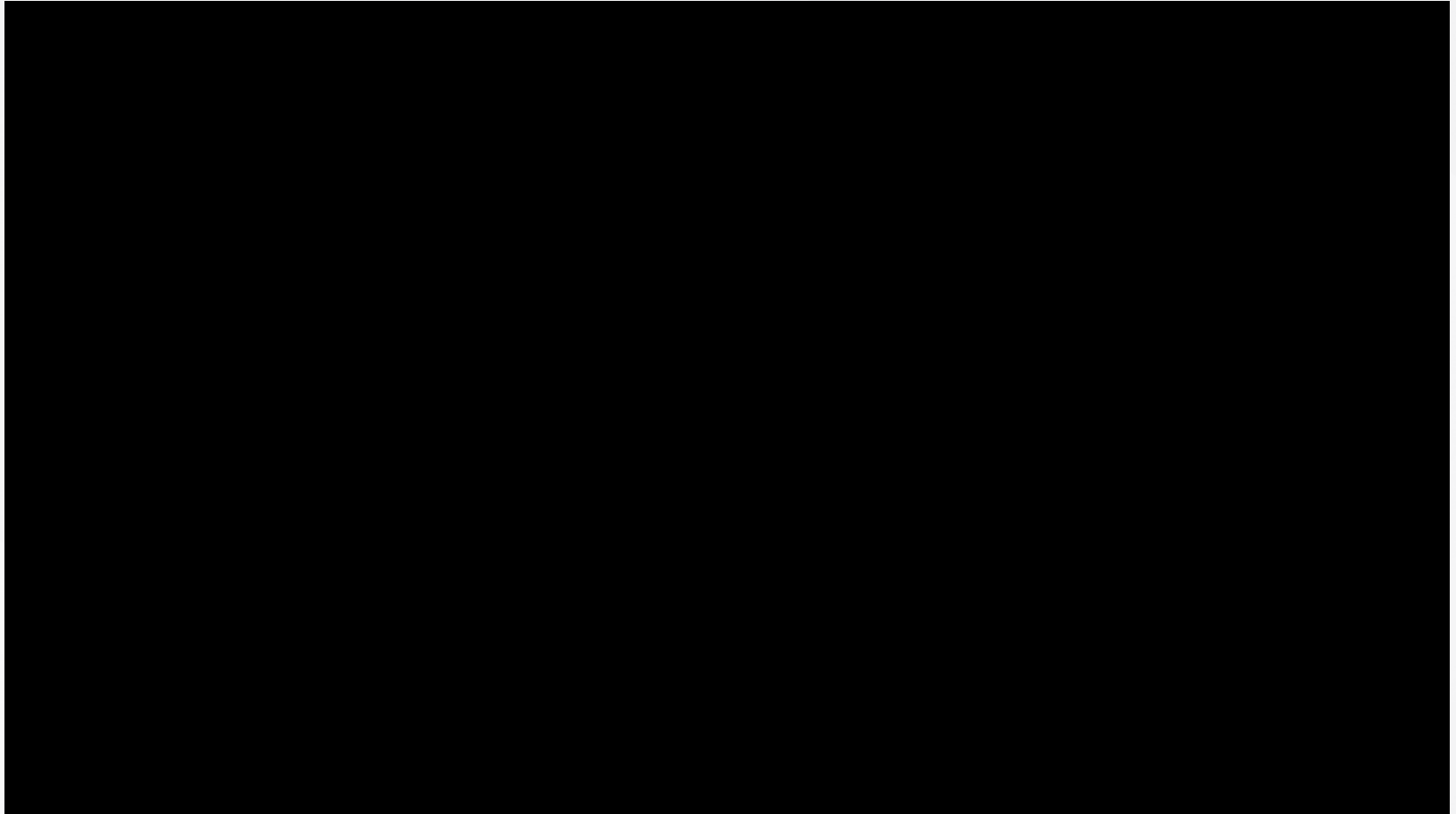
Turn your buildings into Smart Spaces

Cisco Spaces is a cloud platform that connects **people & things** with **spaces** to transform your buildings into smart spaces.

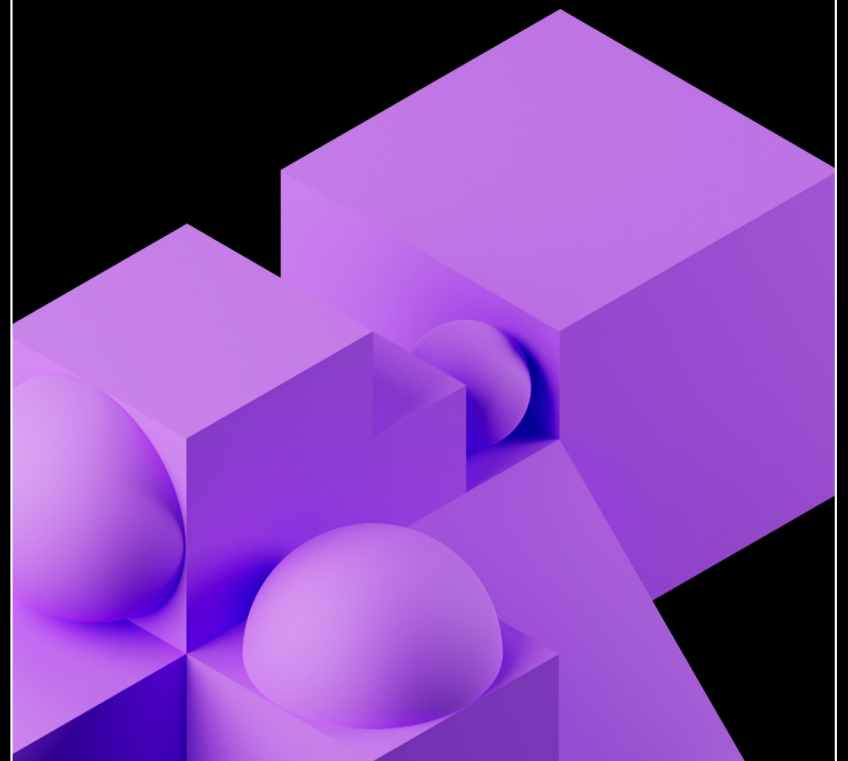
Using the power of your Cisco devices as sensors (Catalyst, Meraki, Webex) and the Spaces ecosystem, to make your buildings Safe, Smart, Sustainable, and Seamless.



Trilateration



Cisco META Streaming API



Digitization Stats

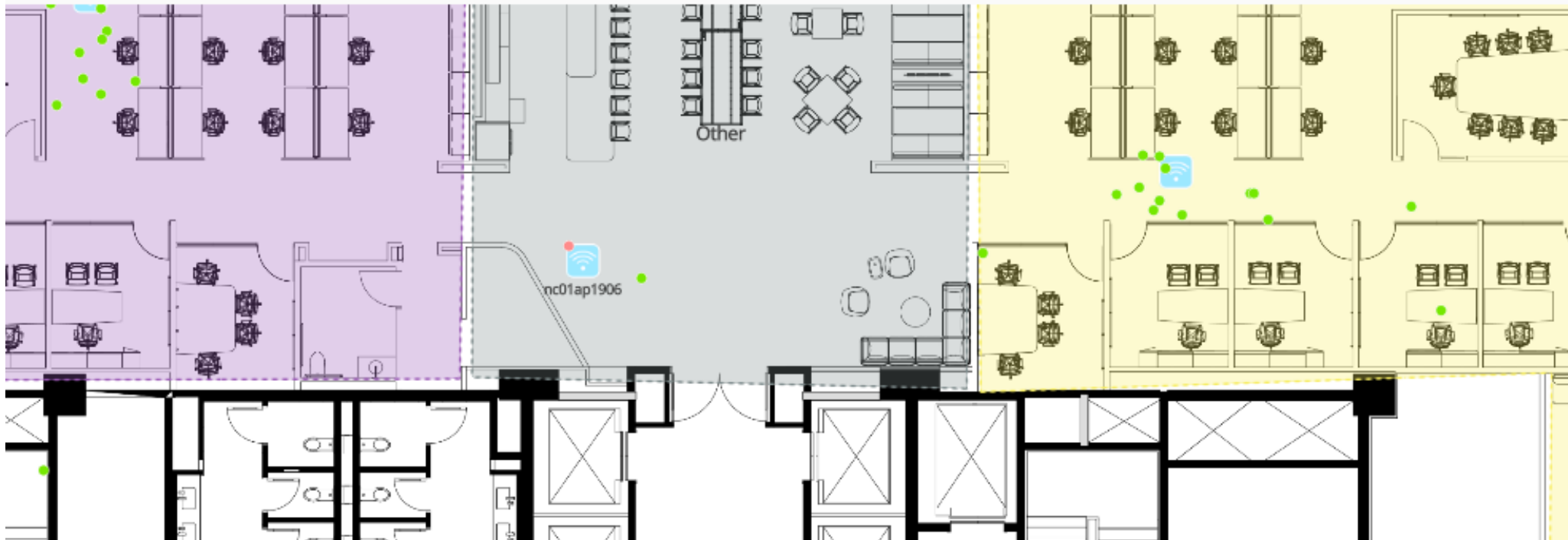
 **750**
750 Locations

 **8,282**
8.3K Access Points

 **97,581,275,393**
97.6 Billion Location Updates

 **25,015,749**
25 Million Square Foot

 **60,657,191**
60.7 Million Visits



Databricks Design Pipeline



Delta Tables

Meta
Data

For
hundreds
of
customers

Ingesting
1000's
buildings

Link to 3rd
party
systems
B2B

Ingesting
1000's
sensors

Bronze

Transformation
Tables



Mapping the
raw telemetry
with meta data

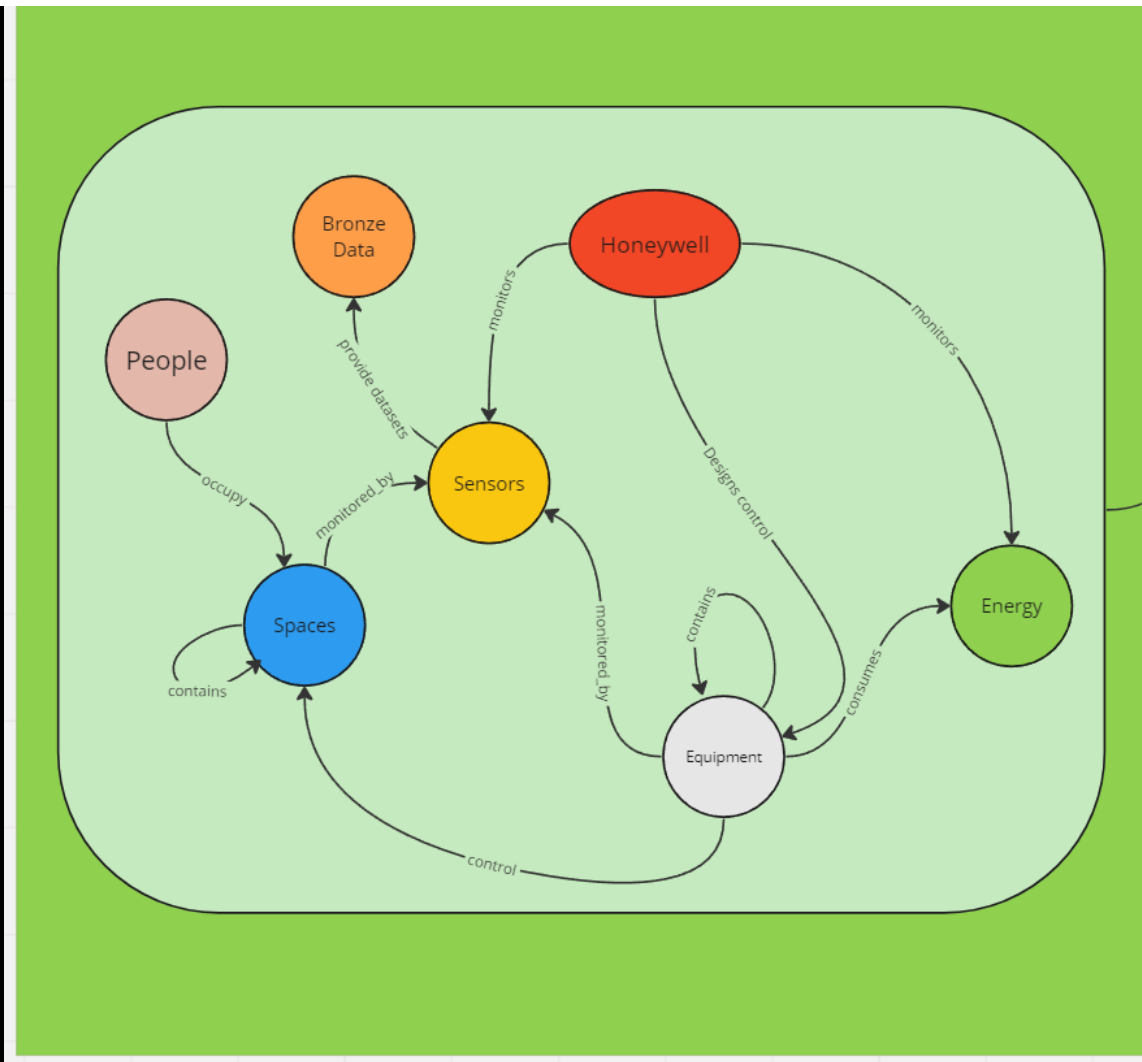
Silver

Optimal
Comfort

Optimal
Schedules

Energy
Prediction

Gold
Outcomes



Delta Live Tables

The best way to do ETL on the lakehouse

```
CREATE STREAMING TABLE raw_data
AS SELECT *
FROM cloud_files ("/raw_data", "json")
```

```
CREATE LIVE TABLE clean_data
AS SELECT ...
FROM LIVE.raw_data
```



Accelerate ETL development

Declare **SQL or Python** and DLT automatically orchestrates the DAG, handles retries, changing data



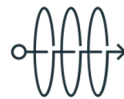
Automatically manage your infrastructure

Automates complex tedious activities like **recovery, auto-scaling, and performance optimization**



Ensure high data quality

Deliver reliable data with built-in **quality controls, testing, monitoring, and enforcement**



Unify batch and streaming

Get the simplicity of SQL with freshness of streaming with one **unified API**



Value Drivers for Delta Live Tables

Accelerate Business Innovation

- Tackle new real-time analytics, ML, and operational use cases
- Provide fresher data to existing business intelligence and analytical applications
- Improve the reliability and trustworthiness of data for everyone

Increase Data Team Productivity

- Enable all your existing practitioners to build data streaming pipelines with ease
- Reduce the burden of maintaining complex data pipelines in production
- Identify, troubleshoot and fix upstream data quality issues much faster

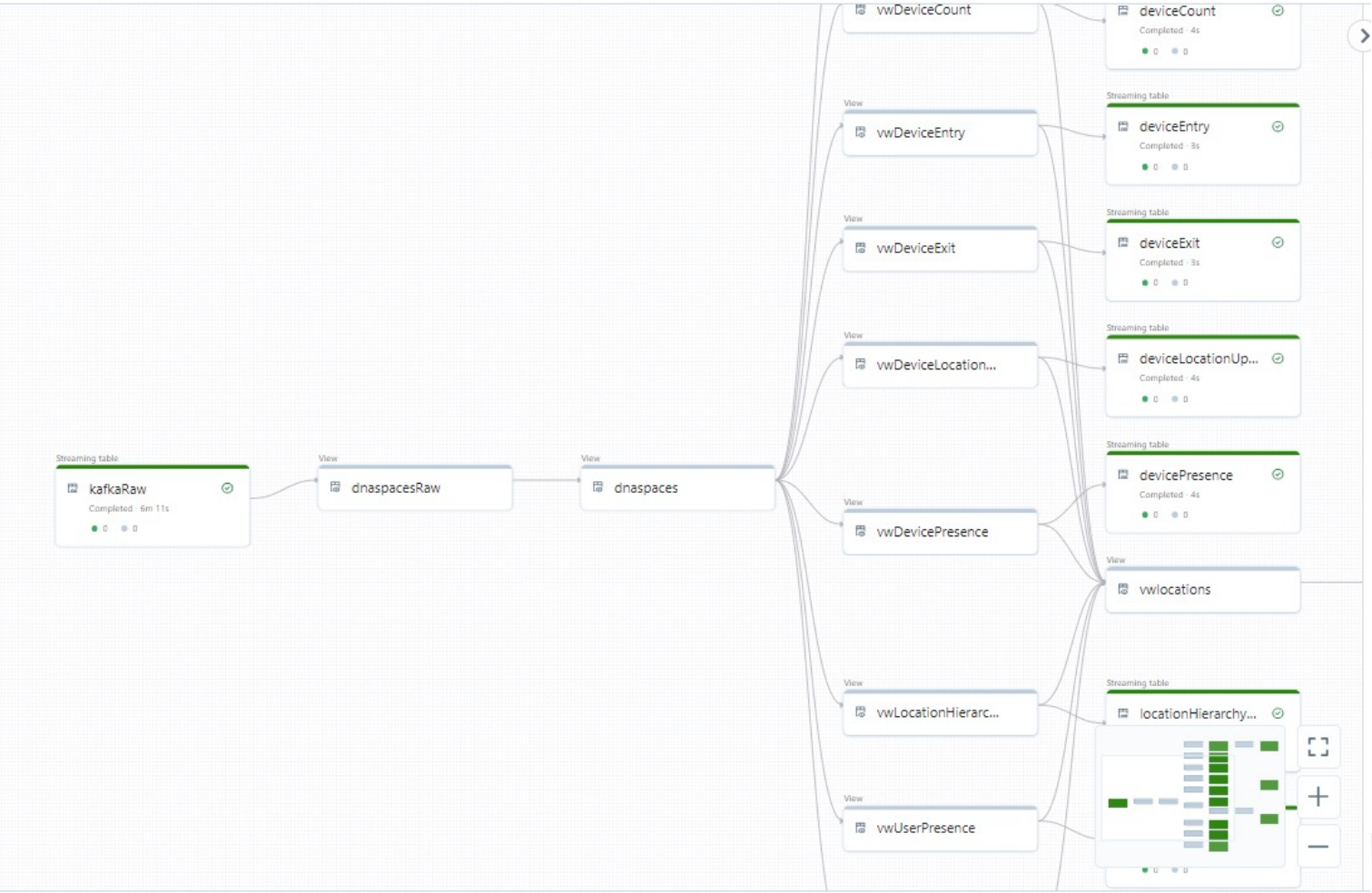
Lower Infrastructure Costs

- Incrementally process data to avoid costly rebuilding of datasets
- Autoscale resources up and down to accommodate fluctuating data volumes
- Adjust each individual workload to exactly the right cost vs latency trade off



6/28/2023, 5:48:11 AM · Completed

Select tables for refresh



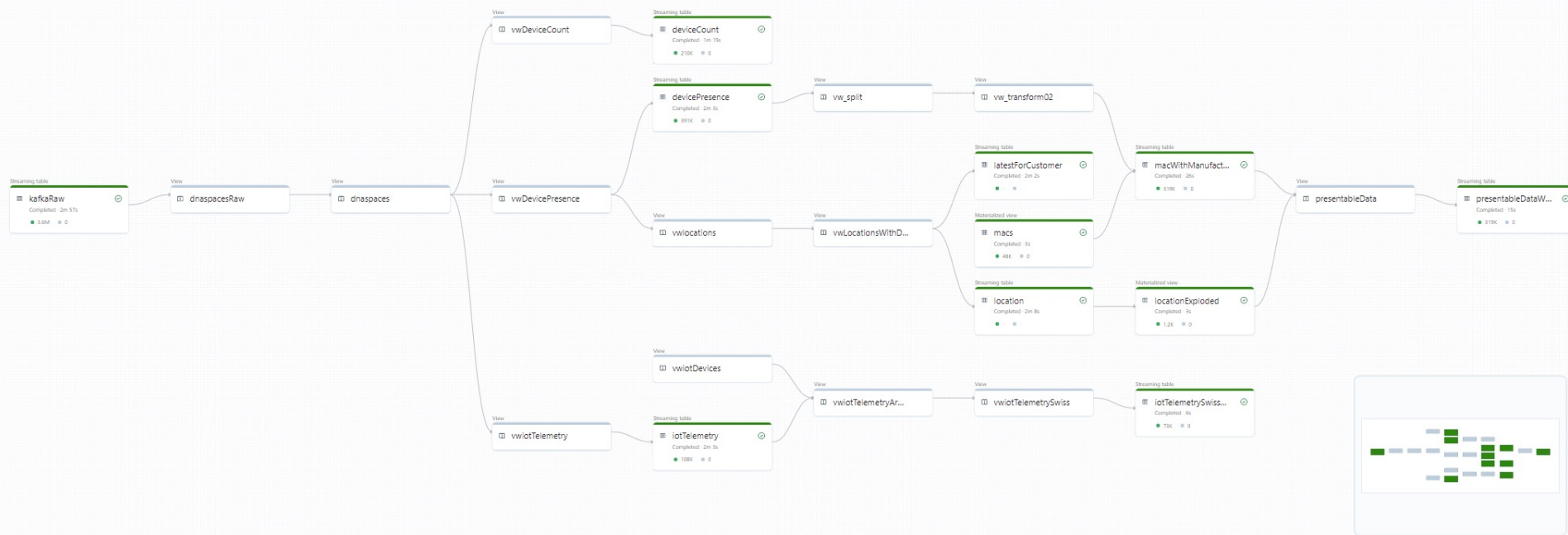
GRE-hon-connector-core

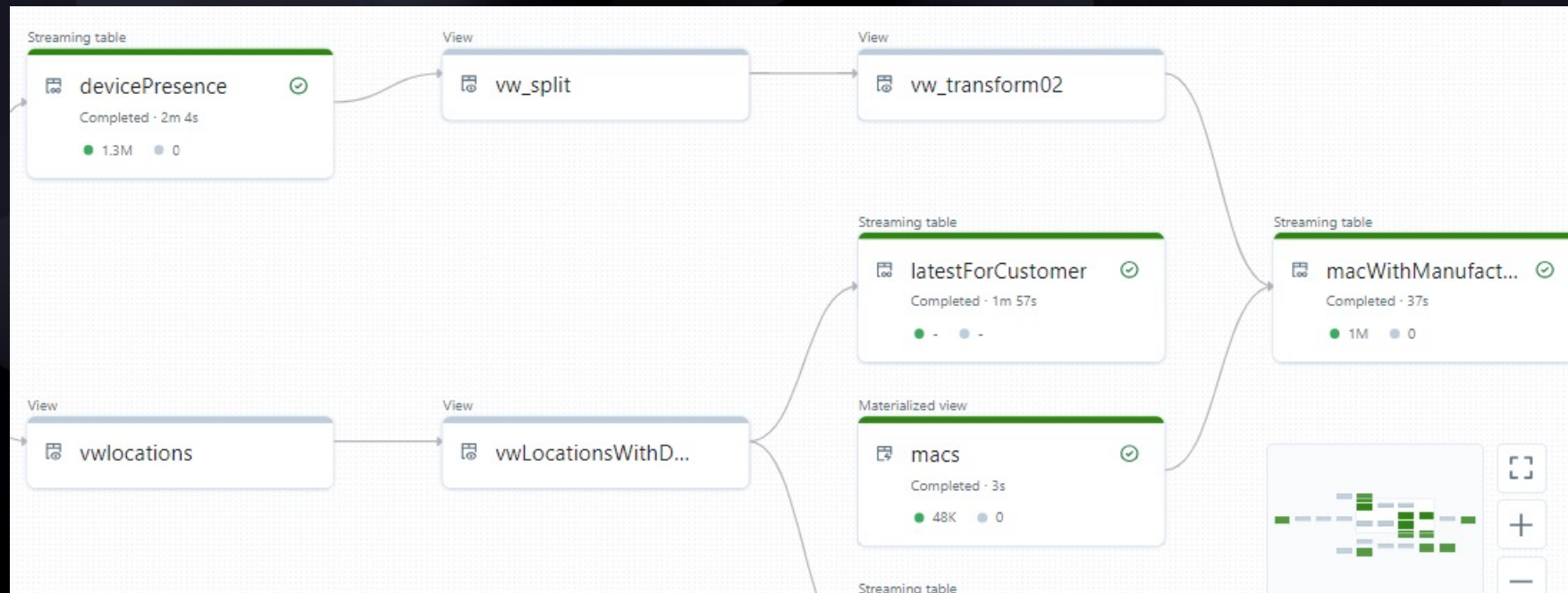
Development

Produ

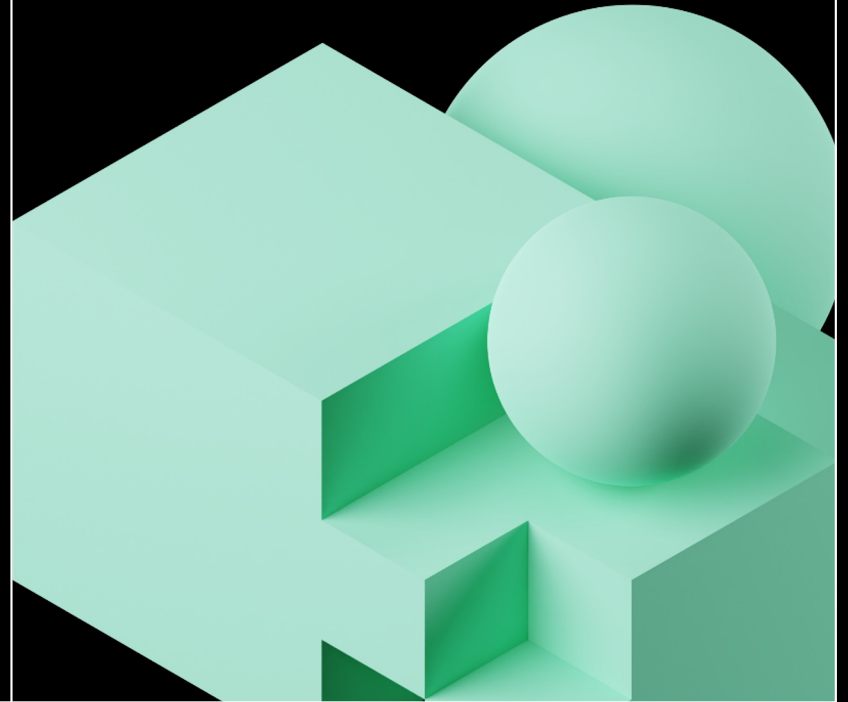
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Select tables for refresh ?





Design Challenges and DLT



DLT Provides us with

Reducing design complexity

DLT came just at the right time for our team and their maturity



Using Kafka as ingestion scales wonderfully

The Auto optimise and Vacuum feature saves us a ton of work

Mockable Sources

Vastly simplifying merge operations

Love how easy it is to customise the optimise routine

Incorporating the disallow reset on certain tables was insightful

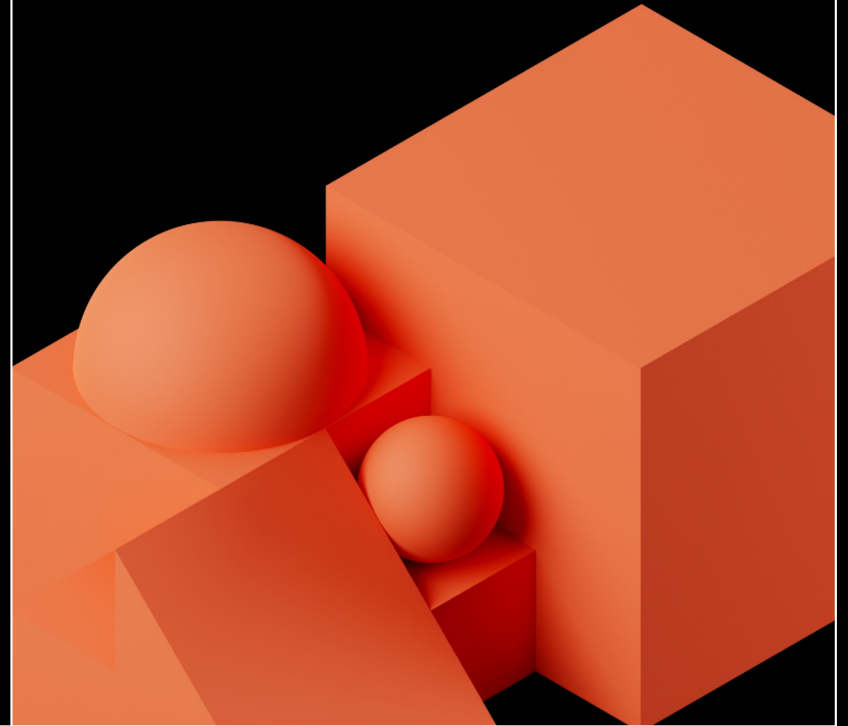
Visualising and designing of Complicated Pipelines

We have developed an automated integration to Unit test entire pipelines

Whole team can reuse common dlt code in separate pipelines

We auto create DLT Views and Tables based upon our meta data

Questions



Resources:



The Engineering ToolBox
www.EngineeringToolBox.com



Microsoft
Azure





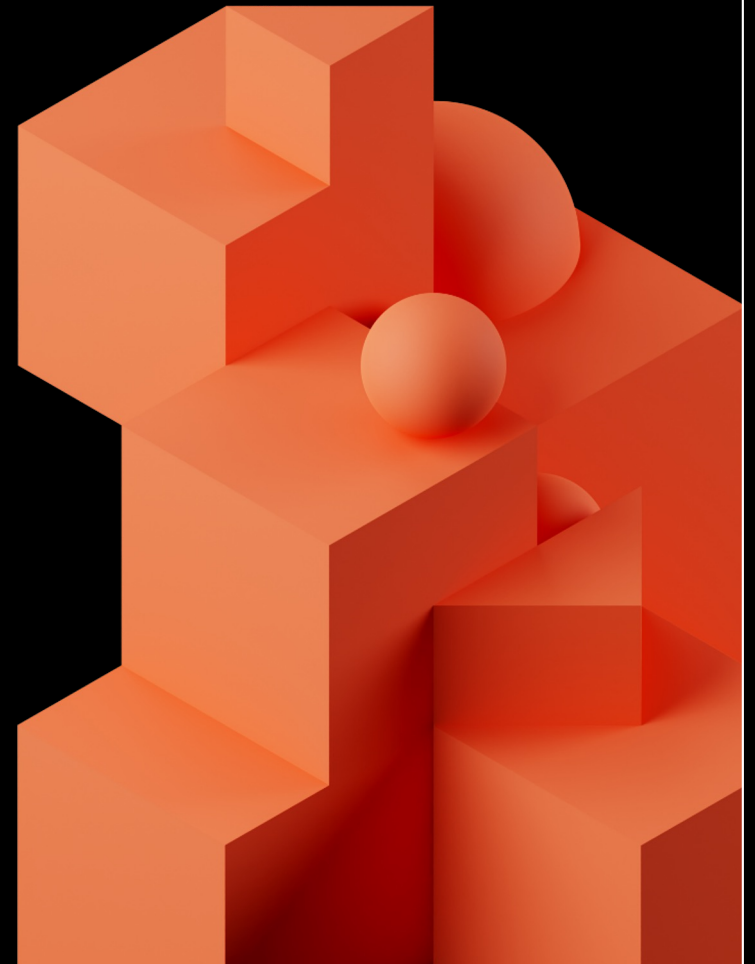
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Slide deck template

Your starting point
for great presentation designs

Databricks
2023



Instructions: Read me!

Getting started with our slide template

- When using this template, create your new slides at the very top of the slide order. Explore the Best Practices guidance and example slides below to find useful layouts and graphics to pull into your design. **When your slide deck is complete, delete this slide and every slide below it.**
- Remember some rooms can have up to 1,000 seats, please make sure your slides are legible and easy to read

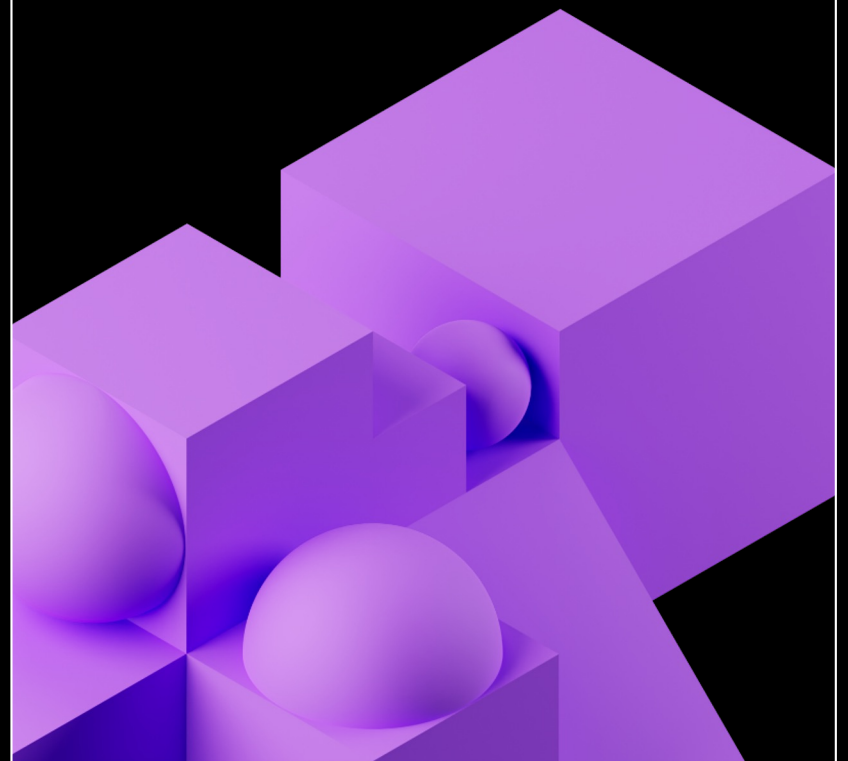


Databricks Speaker – Only

- For any design help, file a design request in Asana and a brand designer can help you out!



Presentation best practices



Presentation best practices

Less is more

Don't be too concerned with the number of slides

Don't cram too much content onto your slides. An optimal number of slides in a presentation is always variable and depends on length, type of presentation, and how it's shared.

If your content is overflowing off the templates, that's a good sign that you need to spread it across more than one slide!

Use font hierarchy to make your content scannable

Human attention span is fairly short. Like, 8 seconds short. Making your content scannable can help get your point across in less time.

Check out the next slide for recommendations on what font sizes to use!

Keep in mind how the deck will be shared or viewed

The set of slides for someone to present live and a presentation that will be shared on its own are quite different. Presenters can add context in their speech and additional text on the slide will be redundant. Keep text short wherever possible.



Font Guidance

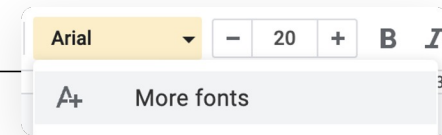
Font selection

All text in our slide decks should use our new brand font, DM Sans.

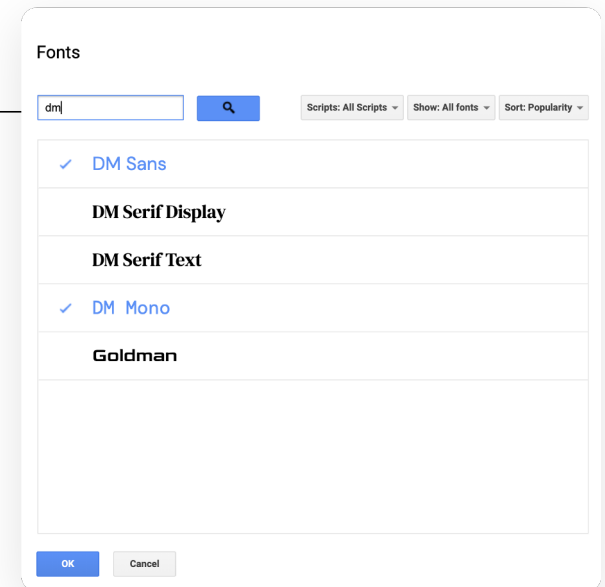
DM Mono is also available for use in code snippets.

If you do not see these fonts in your font selection menu, they can be added by selecting “More fonts” and searching for “dm.” Click on DM Sans and DM Mono, then hit OK.

1



2



Font Guidance (Cont.)

Using fonts in Powerpoint or Pages

To use the fonts in a desktop program such as Microsoft Powerpoint, you'll need to download the font files and install them to your local machine.

Both DM Sans and DM Mono can be downloaded via a single .zip file that is on our Google Drive [here](#). Download and unzip the folder, then install all the fonts inside.



Font Guidance (Cont.)

Font sizing

Using consistent type sizing is a good way to help our slides feel uniform. When selecting type sizes, we try to stick to multiple of 8, with the exceptions of 12 and 20 as in-betweens.

64 The modern L
56 The modern Lak
40 The modern Lakehous
32 The modern Lakehouse Plat
24 The modern Lakehouse platform
20 The modern Lakehouse platform
16 The modern Lakehouse platform
12 The modern Lakehouse platform



Grid Guidance

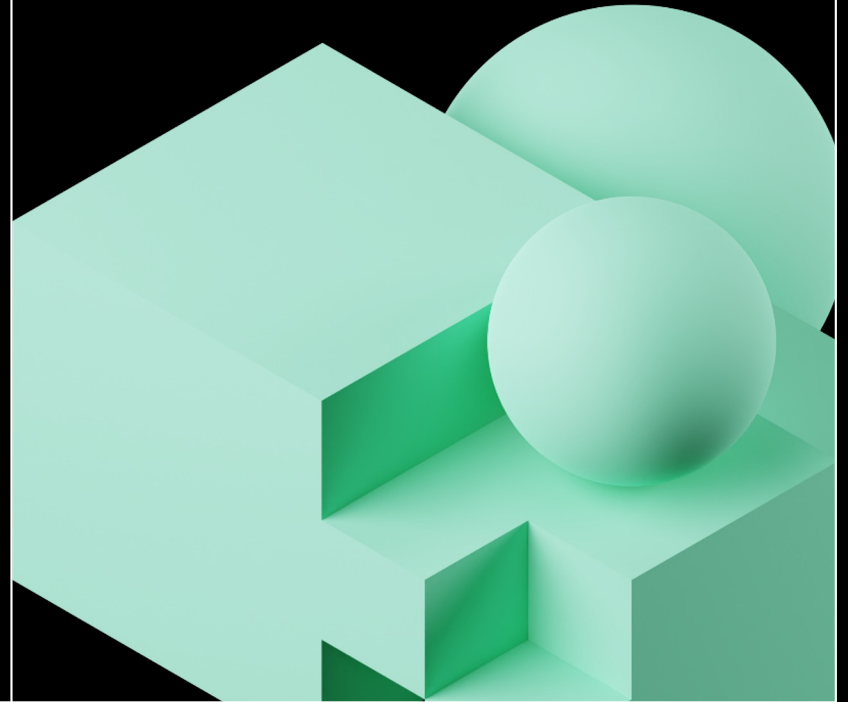
Keep it orderly

Our presentation template has a 12 column grid to help you organize the elements on your slides. When laying out objects, consider using the grid to help!

Toggle the grid visibility by navigating to *View > Guides > Show Guides*.



Title and content slides



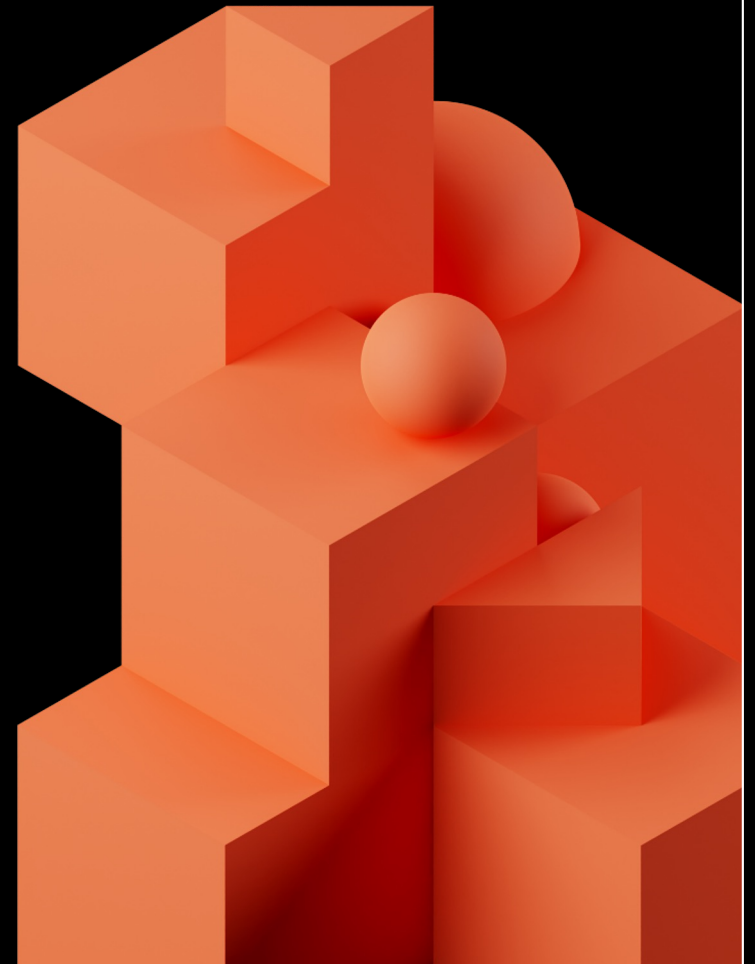
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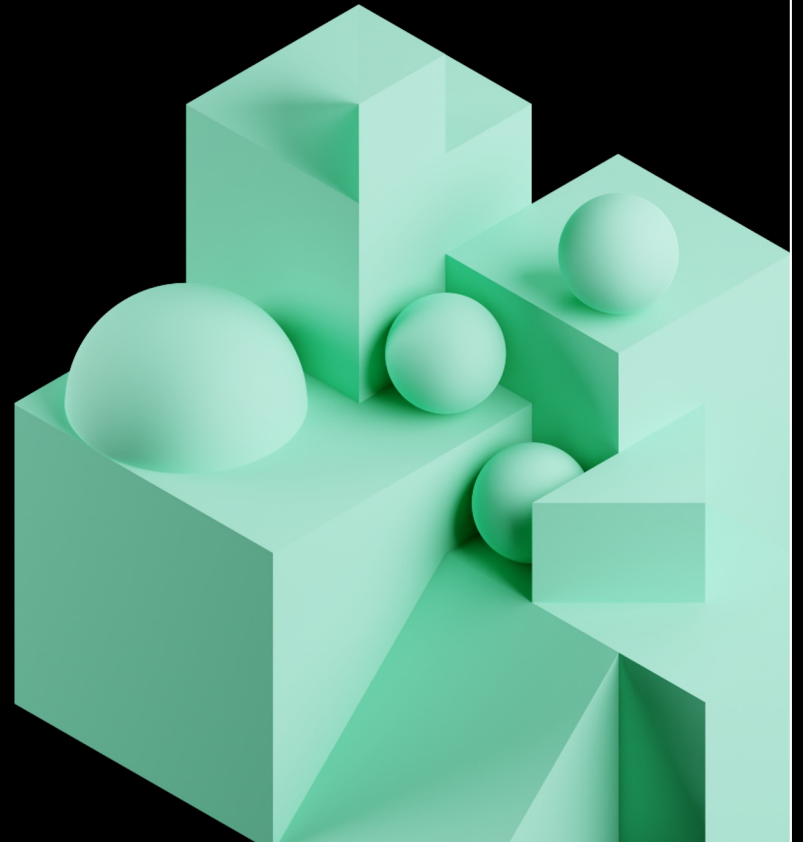
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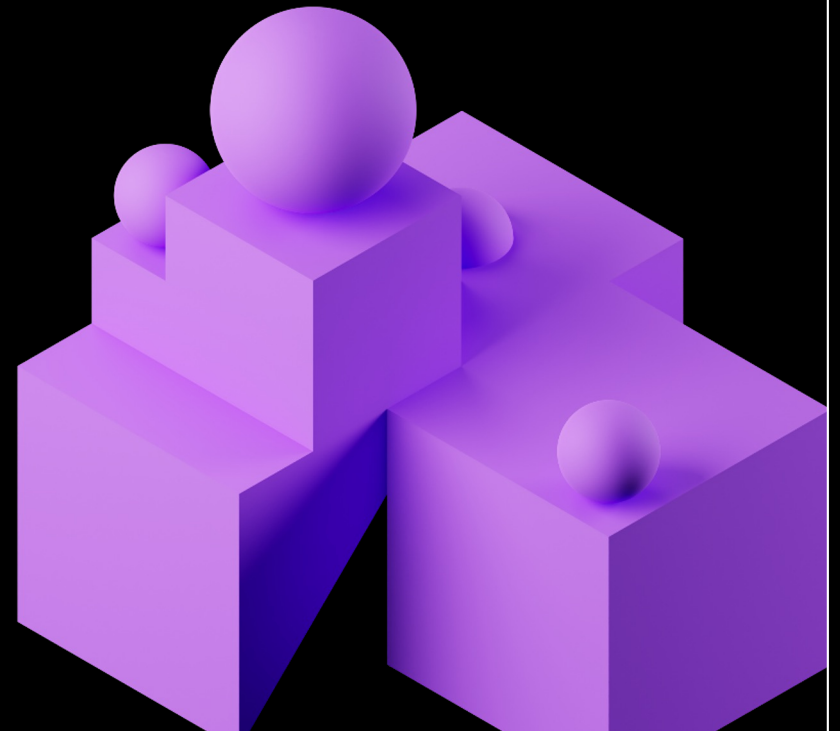
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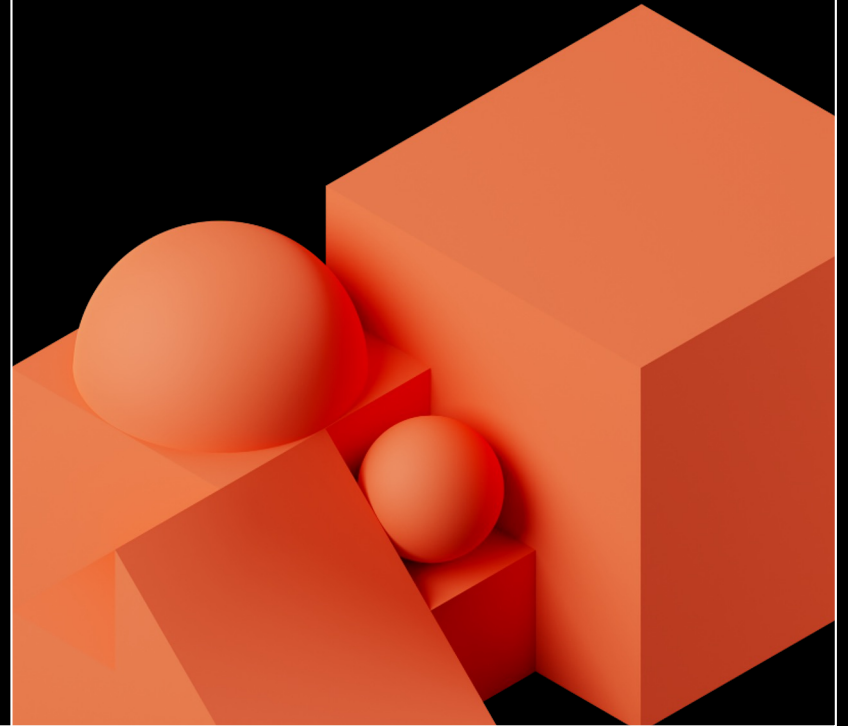
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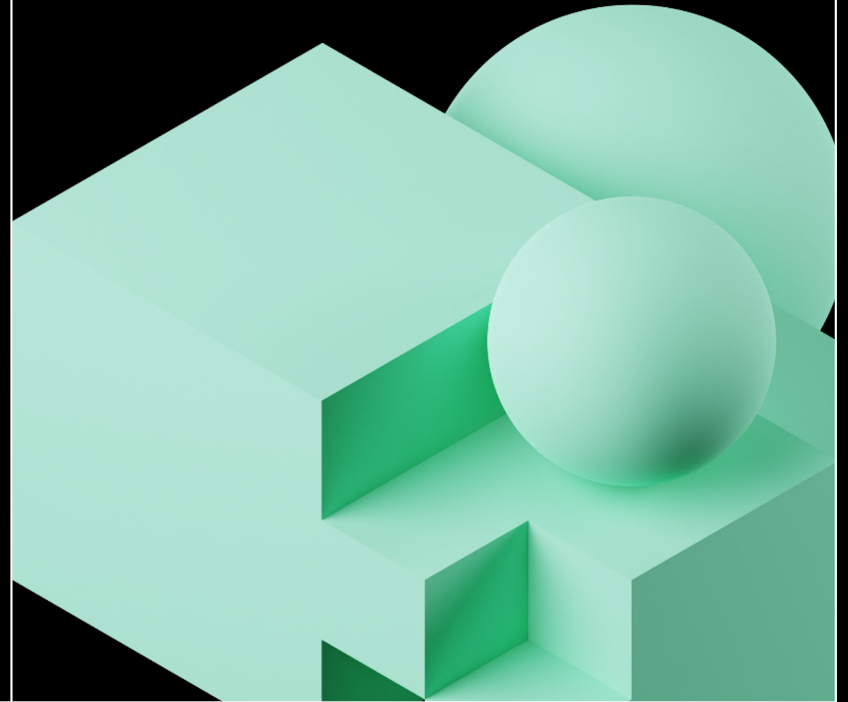
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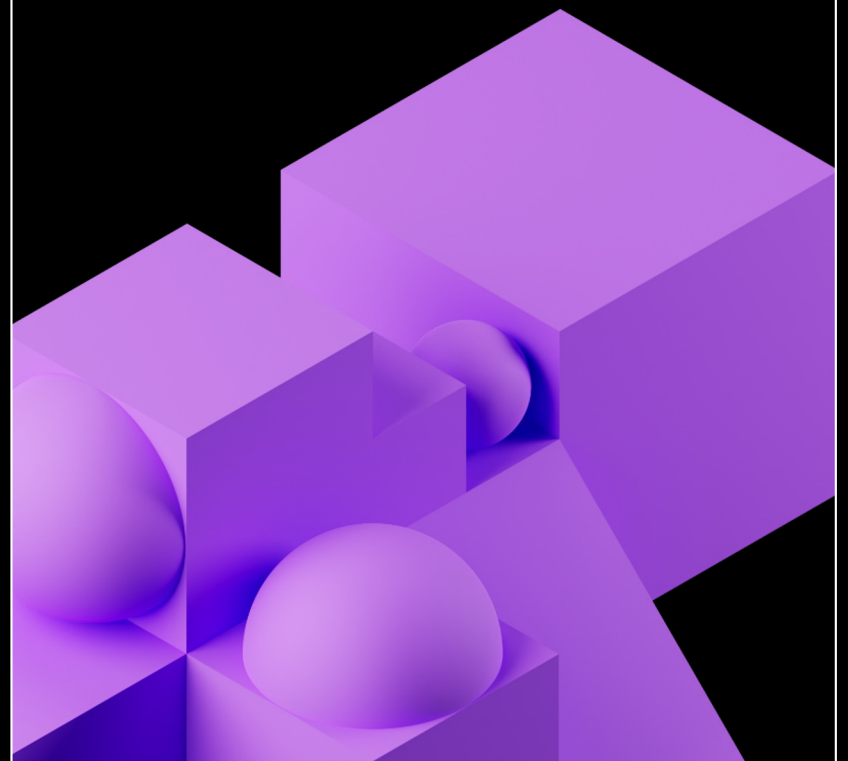
This is your
section slide



This is your
section slide



This is your
section slide



Light content slide

Subtitle here

- Add bulleted text here



Light content slide title and subtitle only

Subtitle here

Light content slide title only

Blank content slide. Best for building custom slide layouts and graphics.

Dark content slide

Subtitle here

- Add bulleted text here

Dark content slide title and subtitle only

Subtitle here

Dark content slide title only

Blank content slide. Best for building custom slide layouts and graphics.

This is your power statement slide. Use it to feature an important statement, a quote, or provide a break between sections.



This is your power statement slide. Use it to feature an important statement, a quote, or provide a break between sections.



APPENDIX



This is your power statement slide. Use it to feature an important statement, a quote, or provide a break between sections.



This is your power statement slide. Use it to feature an important statement, a quote, or provide a break between sections.





Resources: Logos



Logos

Databricks Logos



Logos

Open Source Logos



Logos

Partner Logos



 Google Cloud

looker

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 + a b | e a u®



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Capgemini 

 Microsoft Azure

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 R Studio®

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