

ORACLE

Oracle Database In-Memory

AskTOM Office Hours – New LiveLabs Lab – November 1, 2022

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LiveLabs – Boost Analytics Performance with Database In-Memory

<https://bit.ly/livelabs-dbim>

Oracle LiveLabs

Showcasing how Oracle's solutions can solve **your** business problems



500+

free workshops,
available or in
development

3.5 million

people have already visited
LiveLabs

600+

events run
using LiveLabs
workshops

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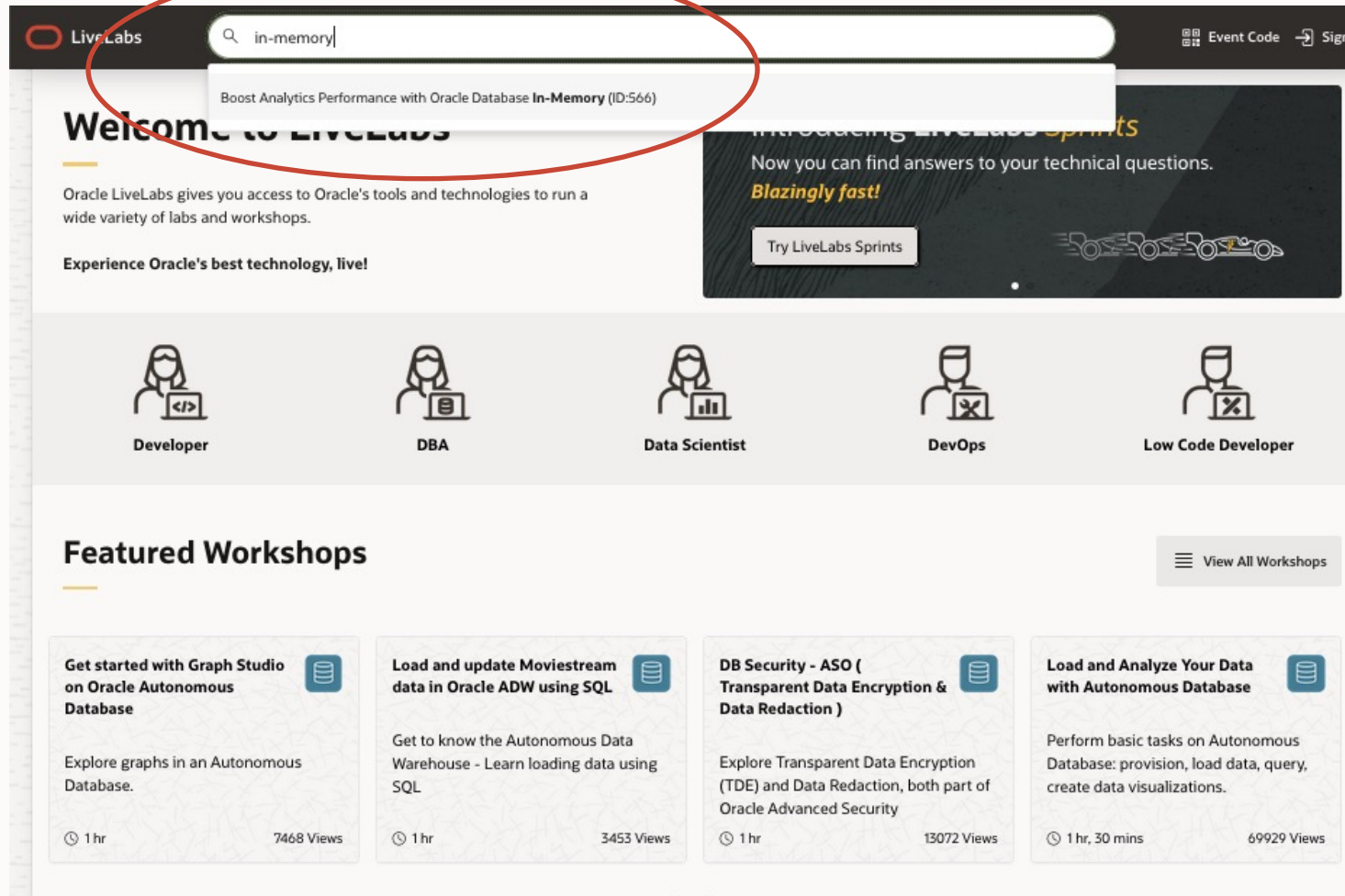


Oracle LiveLabs - <https://developer.oracle.com/livelabs>

The screenshot shows the Oracle LiveLabs website. At the top is a dark navigation bar with the LiveLabs logo, a search bar labeled "Search Workshops and Sprints...", and links for "Event Code" and "Sign". Below the navigation bar, the main content area is divided into two columns. The left column features a "Welcome to LiveLabs" section with a sub-header "Experience Oracle's best technology, live!" and a row of five icons representing different roles: Developer, DBA, Data Scientist, DevOps, and Low Code Developer. The right column contains a "NEW!" banner for "Introducing LiveLabs Sprints" with the text "Now you can find answers to your technical questions. Blazingly fast!" and a "Try LiveLabs Sprints" button. Below these sections is a "Featured Workshops" section with a "View All Workshops" link. This section displays four workshop cards, each with a title, description, duration, and view count.

Workshop Title	Duration	Views
Load and update Moviestream data in Oracle ADW using Data Tools	1 hr	3065 Views
DB Security Basics	5 hrs	21409 Views
Simplify Microservices with Converged Oracle Database	1 hr, 15 mins	33405 Views
Integrate, Analyze and Act on All data using Autonomous Database (Epic)	4 hrs	7139 Views

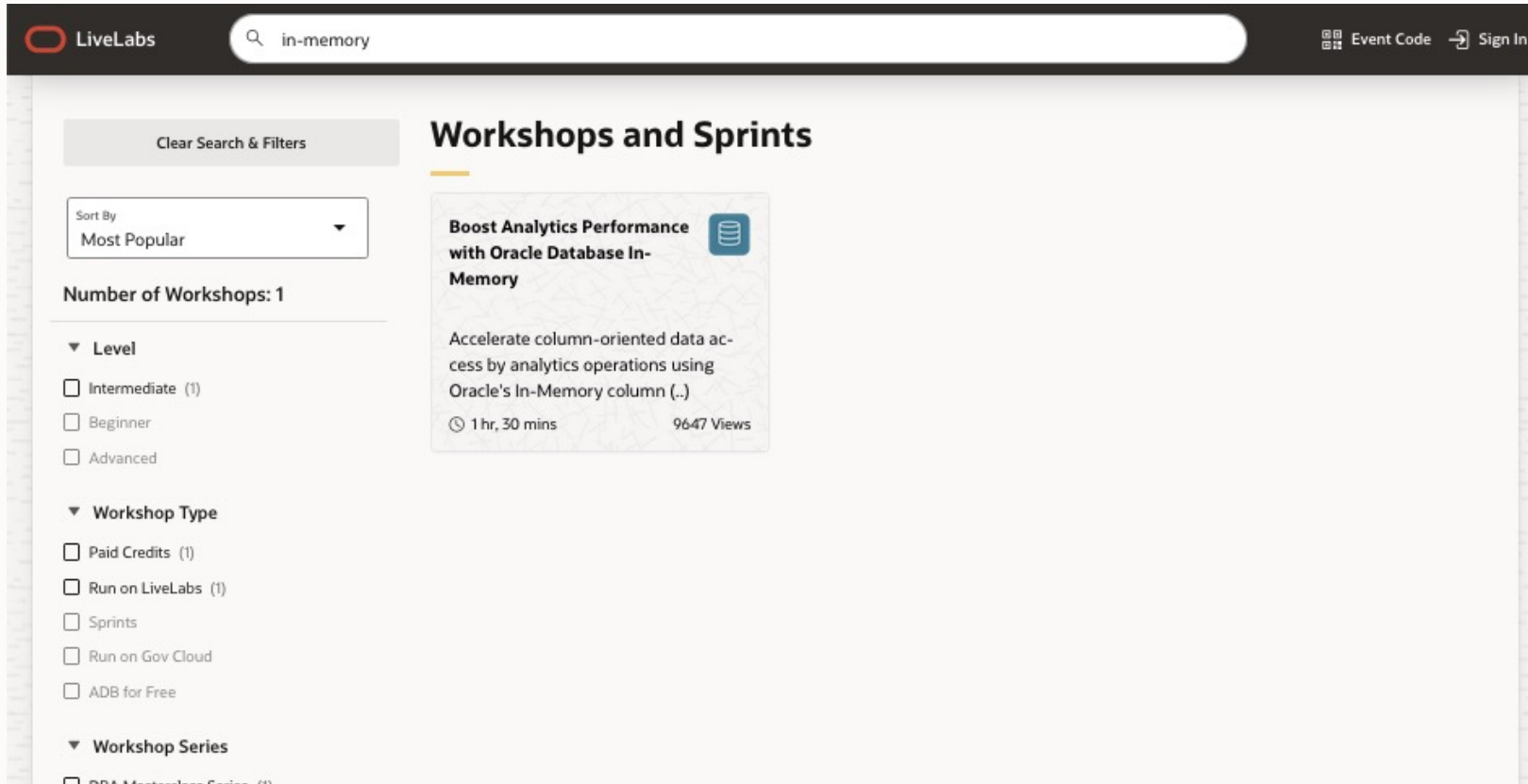
Oracle LiveLabs - <https://developer.oracle.com/livelabs>



The screenshot shows the Oracle LiveLabs website. At the top, there's a navigation bar with the 'LiveLabs' logo, a search bar containing 'in-memory', and links for 'Event Code' and 'Sign'. A dropdown menu from the search bar shows a suggestion: 'Boost Analytics Performance with Oracle Database In-Memory (ID:566)'. Below the navigation bar, a 'Welcome to LIVELABS' section describes the platform's purpose. To the right, a 'Blazingly fast!' banner promotes 'LiveLabs Sprints'. A row of icons represents different roles: Developer, DBA, Data Scientist, DevOps, and Low Code Developer. The 'Featured Workshops' section lists four workshops with their titles, descriptions, durations, and view counts.

Workshop Title	Description	Duration	Views
Get started with Graph Studio on Oracle Autonomous Database	Explore graphs in an Autonomous Database.	1 hr	7468 Views
Load and update Moviestream data in Oracle ADW using SQL	Get to know the Autonomous Data Warehouse - Learn loading data using SQL	1 hr	3453 Views
DB Security - ASO (Transparent Data Encryption & Data Redaction)	Explore Transparent Data Encryption (TDE) and Data Redaction, both part of Oracle Advanced Security	1 hr	13072 Views
Load and Analyze Your Data with Autonomous Database	Perform basic tasks on Autonomous Database: provision, load data, query, create data visualizations.	1 hr, 30 mins	69929 Views

Oracle LiveLabs - <https://bit.ly/livelabs-dbim>



The screenshot shows the Oracle LiveLabs website interface. At the top, there is a dark header with the LiveLabs logo on the left, a search bar containing 'in-memory' in the center, and 'Event Code' and 'Sign In' links on the right. Below the header, the main content area is titled 'Workshops and Sprints'. On the left side of this area, there is a sidebar with filters. At the top of the sidebar is a 'Clear Search & Filters' button. Below it is a 'Sort By' dropdown menu set to 'Most Popular'. Underneath the sort menu, it says 'Number of Workshops: 1'. The sidebar has three main filter sections: 'Level' with options 'Intermediate (1)', 'Beginner', and 'Advanced'; 'Workshop Type' with options 'Paid Credits (1)', 'Run on LiveLabs (1)', 'Sprints', 'Run on Gov Cloud', and 'ADB for Free'; and 'Workshop Series' with an option 'DBA Membership Series (1)'. The main content area displays a single workshop card titled 'Boost Analytics Performance with Oracle Database In-Memory'. The card includes a database icon, a description 'Accelerate column-oriented data access by analytics operations using Oracle's In-Memory column (...)', a duration of '1 hr, 30 mins', and '9647 Views'.

LiveLabs

in-memory

Event Code Sign In

Clear Search & Filters

Sort By
Most Popular

Number of Workshops: 1

▼ Level

- ☐ Intermediate (1)
- ☐ Beginner
- ☐ Advanced

▼ Workshop Type

- ☐ Paid Credits (1)
- ☐ Run on LiveLabs (1)
- ☐ Sprints
- ☐ Run on Gov Cloud
- ☐ ADB for Free

▼ Workshop Series

- ☐ DBA Membership Series (1)

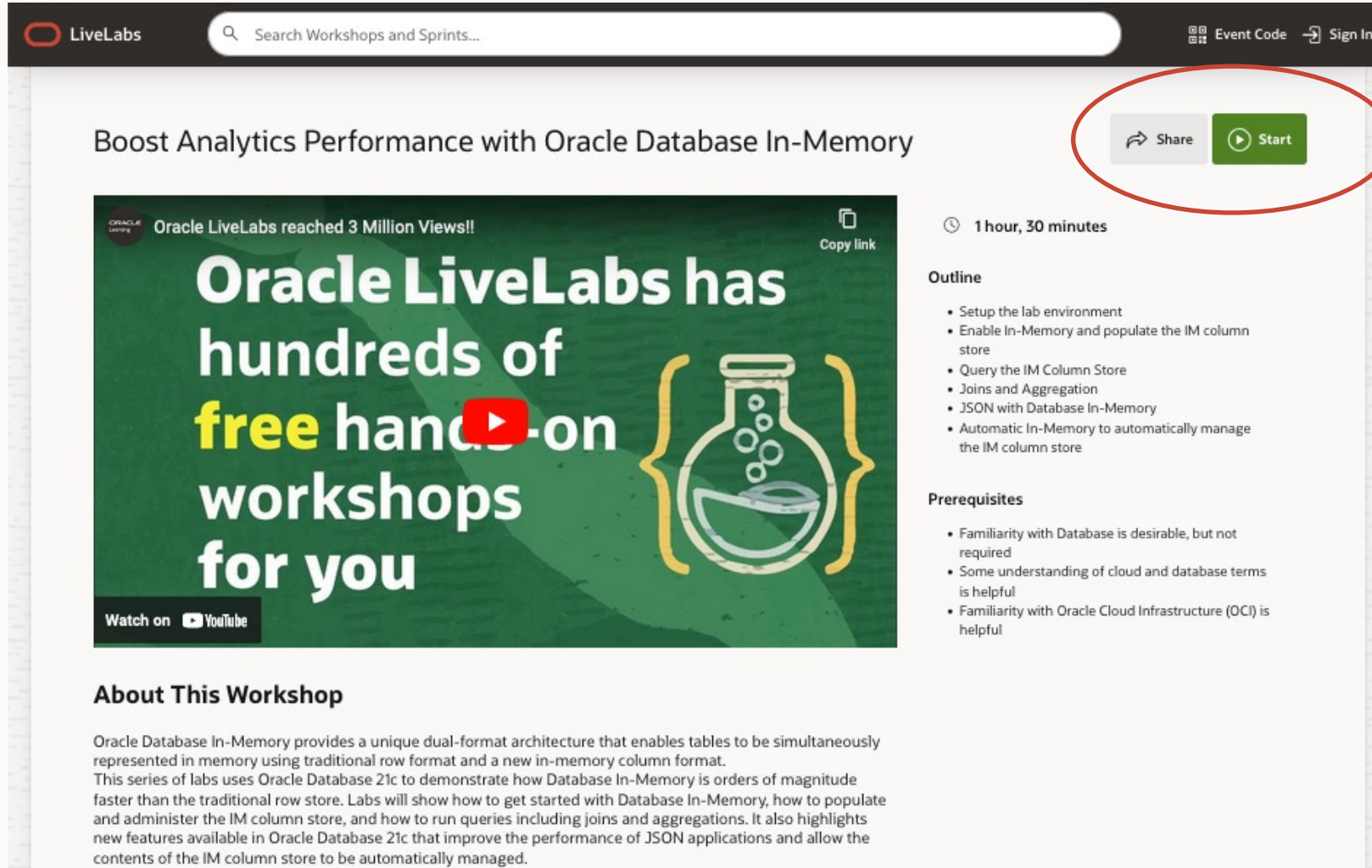
Workshops and Sprints

Boost Analytics Performance with Oracle Database In-Memory

Accelerate column-oriented data access by analytics operations using Oracle's In-Memory column (...)

1 hr, 30 mins 9647 Views

Database In-Memory LiveLabs page



LiveLabs Search Workshops and Sprints... Event Code Sign In

Boost Analytics Performance with Oracle Database In-Memory

Oracle LiveLabs reached 3 Million Views!!

Copy link

Oracle LiveLabs has hundreds of **free** hands-on workshops for you

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1 hour, 30 minutes

Outline


- Setup the lab environment
- Enable In-Memory and populate the IM column store
- Query the IM Column Store
- Joins and Aggregation
- JSON with Database In-Memory
- Automatic In-Memory to automatically manage the IM column store

Prerequisites



- Familiarity with Database is desirable, but not required
- Some understanding of cloud and database terms is helpful
- Familiarity with Oracle Cloud Infrastructure (OCI) is helpful

About This Workshop



Oracle Database In-Memory provides a unique dual-format architecture that enables tables to be simultaneously represented in memory using traditional row format and a new in-memory column format. This series of labs uses Oracle Database 21c to demonstrate how Database In-Memory is orders of magnitude faster than the traditional row store. Labs will show how to get started with Database In-Memory, how to populate and administer the IM column store, and how to run queries including joins and aggregations. It also highlights new features available in Oracle Database 21c that improve the performance of JSON applications and allow the contents of the IM column store to be automatically managed.


 LiveLabs

Search Workshops and Sprints...

 Event Code  Sign In

Boost Analytics Performance with Oracle Database In-Memory


 Share  Start



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The **Run on Your Tenancy** button provides step-by-step instructions so you can run this workshop on your personal tenancy!

Run on Your Tenancy

The **Run on LiveLabs** button will dynamically create resources in an Oracle-owned tenancy for you to use for free!

[Oracle account help](#) | [Oracle account signup](#)

Run on LiveLabs Sandbox

- Familiarity with Database is desirable, but not required
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About This Workshop

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LiveLabs

Search Workshops and Sprints...

Boost Analytics Performance with Oracle Database In-Memory

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Reserve Workshop

Attendee Email Address

andy.rivenes@oracle.com

Attendee Timezone

PST (-07:00)

Required

* Start Workshop Now?

☐

Public SSH key required to set up this workshop

ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQDcXM8KvWKI7z0xV5qVpPsVWQ

Required

☒ I consent to receive emails from LiveLabs for my reservation and I agree that I will not upload sensitive personal or company information to Oracle Cloud Infrastructure

Submit Reservation

Reservations – It takes a few minutes to create your environment

LiveLabs Search Workshops and Sprints... Event Code andy.rivenes@oracle.com




My Reservations

✓ Reservation submitted

All your current workshop reservations are shown below. You can edit active or pending reservations, view workshop details, attend an available workshop, or delete a reservation.

Note: The status of your reservations will be emailed to you. Check your mail for any status updates.

To access this page again click the user dropdown in the top right corner and select **My Reservations**

	Boost Analytics Performance with Oracle Database In-Memory Monday October 31st, 11:48am (11:48) PST	Status: Pending creation	
	Boost Analytics Performance with Oracle Database In-Memory Wednesday October 26th, 9:55am (09:55) PST	Status: Completed	Details Remove
	Boost Analytics Performance with Oracle Database In-Memory Thursday February 10th, 4:51pm (16:51) US/Eastern	Status: Completed	Details Remove

1 - 3

Resources
[Developers](#)
[Startups](#)

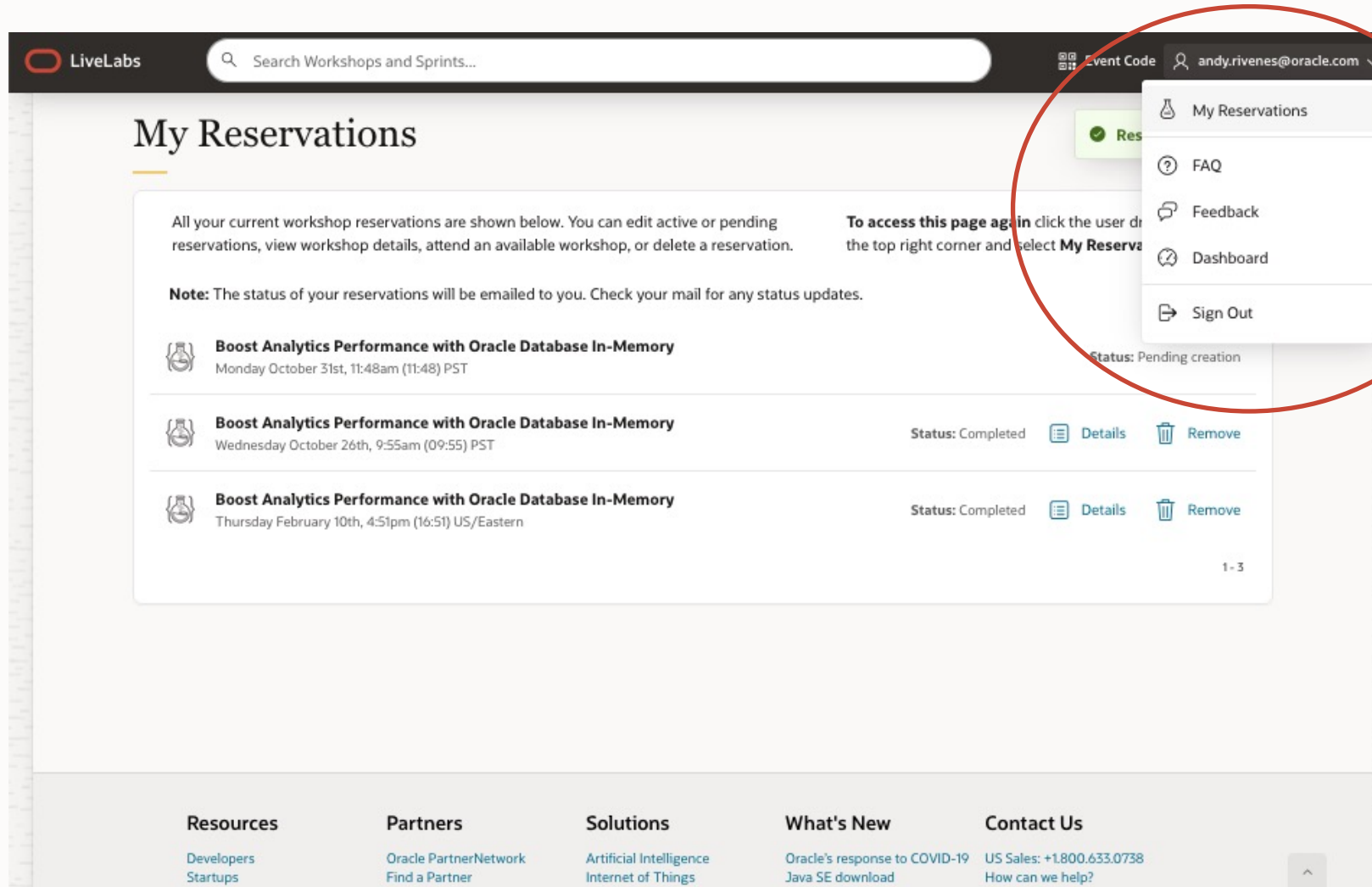
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Reservations – To check the status go to the My Reservations page



The screenshot shows the 'My Reservations' page on the LiveLabs website. The page header includes the LiveLabs logo, a search bar, and a user profile dropdown menu. A red circle highlights the user menu, which contains the following options: My Reservations, FAQ, Feedback, Dashboard, and Sign Out. A red arrow points to the user profile icon in the header. The main content area displays a list of reservations for the workshop 'Boost Analytics Performance with Oracle Database In-Memory'. The first reservation is pending creation, while the other two are completed. Each reservation entry includes a status, a 'Details' link, and a 'Remove' link. The footer contains links for Resources, Partners, Solutions, What's New, and Contact Us.

LiveLabs Search Workshops and Sprints... Event Code andy.rivenes@oracle.com

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How can we help?

Workshop is ready – click on Launch Workshop











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1 - 3

Resources
[Developers](#)
[Startups](#)

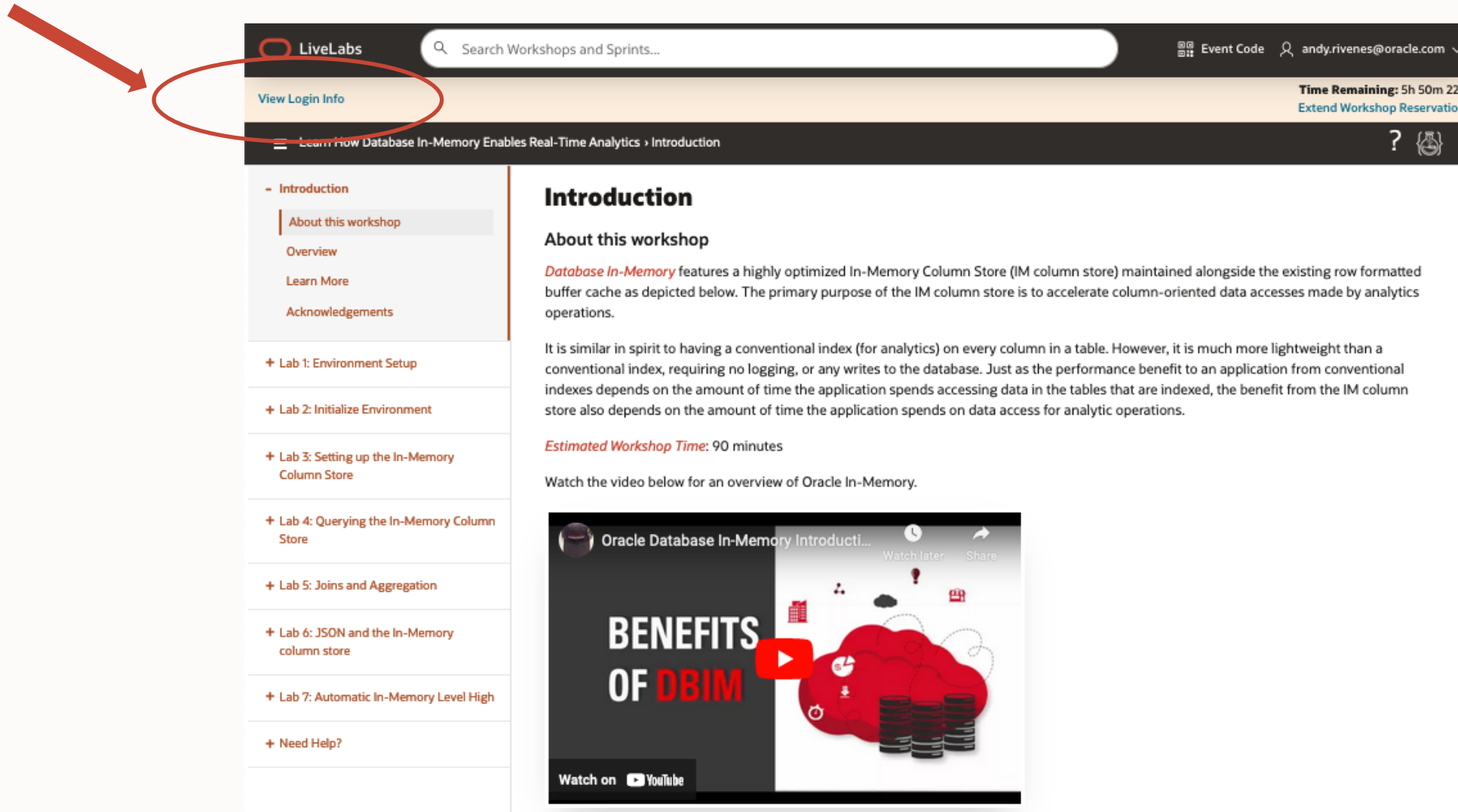
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[Java SE download](#)

Contact Us
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Lab Landing Page – Click “View Login Info”



The screenshot shows the LiveLabs interface. At the top, there's a dark header with the 'LiveLabs' logo, a search bar, and user information. Below this is a light orange banner with the 'View Login Info' link circled in red. The main content area is titled 'Introduction' and includes a sidebar with navigation links, a description of the workshop, and a video player.

LiveLabs Search Workshops and Sprints... Event Code andy.rivenes@oracle.com

[View Login Info](#) Time Remaining: 5h 50m 22s
[Extend Workshop Reservation](#)

Learn How Database In-Memory Enables Real-Time Analytics > Introduction

- Introduction
- About this workshop
- Overview
- Learn More
- Acknowledgements

+ Lab 1: Environment Setup

+ Lab 2: Initialize Environment

+ Lab 3: Setting up the In-Memory Column Store

+ Lab 4: Querying the In-Memory Column Store

+ Lab 5: Joins and Aggregation

+ Lab 6: JSON and the In-Memory column store

+ Lab 7: Automatic In-Memory Level High

+ Need Help?

Introduction

About this workshop

Database In-Memory features a highly optimized In-Memory Column Store (IM column store) maintained alongside the existing row formatted buffer cache as depicted below. The primary purpose of the IM column store is to accelerate column-oriented data accesses made by analytics operations.

It is similar in spirit to having a conventional index (for analytics) on every column in a table. However, it is much more lightweight than a conventional index, requiring no logging, or any writes to the database. Just as the performance benefit to an application from conventional indexes depends on the amount of time the application spends accessing data in the tables that are indexed, the benefit from the IM column store also depends on the amount of time the application spends on data access for analytic operations.

Estimated Workshop Time: 90 minutes

Watch the video below for an overview of Oracle In-Memory.

Oracle Database In-Memory Introducti... Watch later Share

BENEFITS OF DBIM

Watch on YouTube

Launch the Workshop Environment

LiveLabs

Search Workshops and Sprints...

View Login Info

Learn How Database In-Memory Enables Real-Time Analytics » Introduction

- Introduction

About this workshop

Overview

Learn More

Acknowledgements

+ Lab 1: Environment Setup

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+ Lab 7: Automatic In-Memory Level High

+ Need Help?

Introduction

About this workshop

Database In-Memory features a highly optimized In-Memory buffer cache as depicted below. The primary purpose of the In-Memory column store also depends on the amount of time the application spends on the amount of time the application spends.

It is similar in spirit to having a conventional index (B-tree) which requires no logging, or any write operations. It also depends on the amount of time the application spends on the amount of time the application spends.

Estimated Workshop Time: 90 minutes

Watch the video below for an overview of Oracle In-Memory Column Store.

Oracle Database In-Memory Introduction

BENEFITS OF DBIM

Watch on YouTube

Reservation Information

X

Remote Desktop URL

`http://150.136.47.86:6080/vnc.html?password=VK3M0TQCBZ&resize=scale&quality=9&autoconnect=true`

Launch Remote Desktop

Instances Provisioned

LL37211-INSTANCE-DBHOL: 150.136.47.86



Boost Analytics LiveLabs environment

The screenshot displays the Boost Analytics LiveLabs environment. On the left, a web browser window titled "Learn How Database In-Memory Enables Real-Time Analytics | Introduction" shows the "Introduction" page of a workshop. The page includes a sidebar with navigation links: "Introduction", "About this workshop", "Overview", "Learn More", and "Acknowledgements". The main content area is titled "Introduction" and "About this workshop". It describes the Database In-Memory (DBIM) feature, highlighting its highly optimized In-Memory Column Store (IM column store) maintained alongside the existing row formatted buffer cache. The primary purpose of the IM column store is to accelerate column-oriented data accesses made by analytics operations. It is compared to a conventional index, noting that while it is more lightweight, it requires no logging or any writes to the database. The performance benefit depends on the amount of time the application spends accessing data in the tables that are indexed, and the benefit from the IM column store also depends on the amount of time the application spends on data access for analytic operations. The estimated workshop time is 90 minutes, and a video titled "Oracle Database In-Memory Introduction" is recommended for an overview of Oracle In-Memory. The video thumbnail shows the text "BENEFITS OF DBIM" and a red play button icon. Below the video, there is a button labeled "Expand All Tasks".

On the right, a terminal window titled "Terminal" displays the Oracle LiveLabs ASCII art logo. Below the logo, the environment variables are listed:

```
ENV VARIABLES
-----
PRIVATE_IP    = 10.0.0.27
PUBLIC_IP     = 158.136.47.86
HOSTNAME      = dbhol.livelabs.oraclevcn.com
-----
Database ENV is not set

Run this to reload/setup the Database ENV: source /usr/local/bin/.set-env-db.sh
-----

[oracle@dbhol:~]$
```

The terminal window also shows the Oracle Linux logo at the bottom right.



Get Started with the Lab

The screenshot displays the Oracle LiveLabs interface. On the left, a sidebar lists various lab steps, with 'Lab 1: Initialize Environment' highlighted by a red circle. The main content area shows the 'Initialize Environment' page, which includes a video player with a red play button, a list of objectives, prerequisites, and a 'NOTE' section. The 'Expand All Tasks' button is also circled in red. To the right, a terminal window shows the 'Oracle LiveLabs' logo, environment variables (PRIVATE_IP, PUBLIC_IP, HOSTNAME), and a message stating 'Database ENV is not set'. The terminal also displays the command to reload/setup the Database ENV: `source /usr/local/bin/.set-env-db.sh`.

Learn How Database In-Memory Enables Real-Time Analytics | Lab 1: Initialize Environment

Learn How Database In-Memory Enables Real-Time Analytics > Initialize Environment

+ Introduction

+ Get Started

+ Lab 1: Initialize Environment

+ Lab 2: Setting up the In-Memory Column Store

+ Lab 3: Querying the In-Memory Column Store

+ Lab 4: Joins and Aggregation

+ Lab 5: JSON and the In-Memory column store

+ Lab 6: Automatic In-Memory Level High

+ Need help?

Initialize Environment

Objectives

- Initialize the workshop environment.

Prerequisites

This lab assumes you have:

- A Free Tier, Paid or LiveLabs Oracle Cloud account
- You have completed:
 - Lab: Prepare Setup (Free Tier and Paid Tenants only)
 - Lab: Environment Setup

NOTE: When doing Copy/Paste using the convenient Copy function used throughout the guide, you must hit the ENTER key after pasting. Otherwise the last line will resolve in the buffer until you hit ENTER.

Expand All Tasks

+ Task 1: Validate That Required Processes are Up and Running.

+ Task 2: Initialize Database for In-Memory Use Cases

+ Task 3: Enable In-Memory

Terminal

File Edit View Search Terminal Help

Oracle LiveLabs

ENV VARIABLES

```
. PRIVATE_IP      = 10.0.0.27
. PUBLIC_IP      = 158.138.47.86
. HOSTNAME       = dbhol.livelabs.oraclevcn.com
```

Database ENV is not set

Run this to reload/setup the Database ENV: `source /usr/local/bin/.set-env-db.sh`

[oracle@dbhol:~]\$

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Linux



Lab Agenda

- Introduction
- Get Started
- Lab 1: Initialize Environment
- Lab 2: Setting up the In-Memory Column Store
- Lab 3: Querying the In-Memory Column Store
- Lab 4: Joins and Aggregation
- Lab 5: JSON and the In-Memory Column Store
- Lab 6: Automatic In-Memory Level High

Running the Lab

- Be sure to follow the directions in Lab 1 and Lab 2 to setup the environment correctly
- The LINEORDER table is now partitioned on year
- The Setup, Querying and Joins and Aggregations labs are similar to the previous Lab
- The JSON lab incorporates 19c and 21c features
- The Automatic In-Memory lab highlights a new 21c feature

Additional Information

- The lab is meant to be run in SQL*Plus
- There are multiple directories, one for each lab
- You can run the scripts or copy and paste the SQL from the Lab guide (Hint: run the scripts)
- Each script creates a new session which resets the session stats to allow you to see only what happened during the SQL statement being observed

Where Can You Get More Information?

<https://blogs.oracle.com/in-memory/dbim-resources>

