

# **HPE Ezmeral Unified Analytics Software**



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## Executive summary

Enterprises today operate in hybrid cloud environments, with data distributed among data centers, business edges, and public clouds, making analytics from the edge to cloud necessary. Being able to quickly develop and deploy data and analytics applications across hybrid environments is critical to driving real-time business insights, innovating, creating new experiences for their customers, or expanding revenue by developing new products and services.

As such, connecting to data and processing analytics across hybrid environments is critical. The public cloud is one option for resolving this problem because it is scalable, spins up quickly, and has low initial costs. But there are still challenges, such as vendor lock-in, unpredictable costs, and not being open or extensible across clouds and on-premises.

## Target audience

This document is intended for data systems and platform architects who architect, design, and select data analytics solutions for enterprises. This document will also be useful to data engineers, data analysts, data scientists, and other data users who may want to become more familiar with the components of HPE Ezmeral Unified Analytics Software they specialize in.

## Document purpose

This paper highlights recognizable benefits to technical audiences and details the features of HPE Ezmeral Unified Analytics Software.

## Introduction

Enterprises need an open, consistent software stack to simplify managing data and analytics applications across their hybrid cloud to advance their data-first strategies. Enterprises want software that allows them to focus on their distributed business by leveraging data globally, accelerating app development, and confidently enabling analytics-driven processes and insights with a consistent cloud experience from edge to cloud. Ideally, the software stack is:

- **Hybrid by design:** Abstract the developer from the deployment model by creating a consistent solution and experience irrespective of where data and apps reside.
- **Open:** Dedicated to modern open-source tools that eliminate vendor lock-in and give you the freedom to use the tools, technology, and data format best suited for the task at hand.
- **Extensible:** Flexibility to adapt as technology and needs evolve to easily add new types of data and sources while bringing in the tools of choice, including open-source, ISVs, and custom apps.
- **Consistent experience:** Deliver a simple, end-to-end solution with a consistent experience and predictable consumption-based costs.

## Data analytics infrastructure

As of 2023, we continue to witness the proliferation of massive, complicated systems that are centered around data. The primary value of these systems comes from data analysis, and this trend is rapidly transforming most industries, leading to the emergence of new personas such as data analysts and data scientists, changes in corporate IT investment, and the rapid introduction of products that provide infrastructure and tools for managing, analyzing, and presenting this data.

These systems provide powerful machine learning and AI-driven decision-making, primarily using open-source software solutions. The range of tools, frameworks, and infrastructure on which these systems are being built is becoming more extensive and complex. It includes everything from global data networks that are on-prem, in the cloud, or hybrid and are deployed with both hardware and software storage solutions.

The focus on data continues to shape the business landscape, and companies across all industries are investing heavily in data-driven solutions to gain a competitive edge. The importance of data management and analysis is more significant than ever before.

## The HPE Ezmeral Software solution

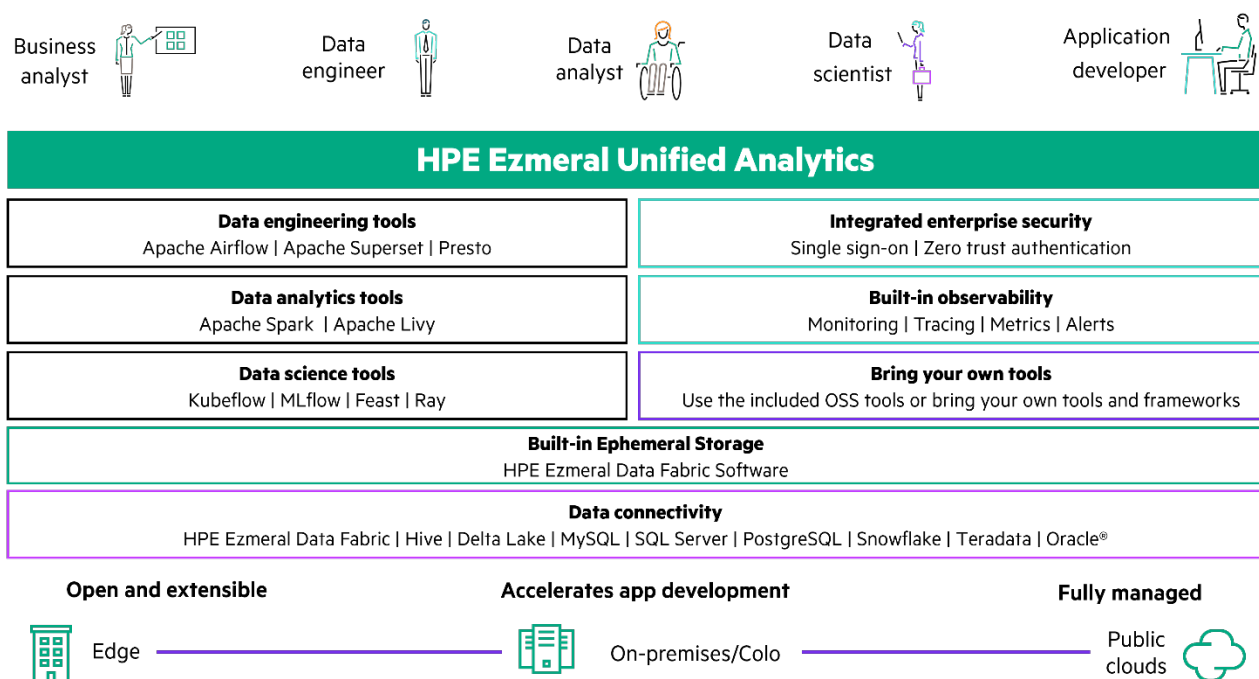
Customers are finding it extremely difficult to operationalize open-source tools. The issues they encounter are operational overheads, with the burden of maintaining interoperability between tools on separate release lifecycles, updates, patches, and common vulnerability exposures (CVEs). It also impacts implementing enterprise security brackets around the tools and day 2 operations.

The HPE Ezmeral Software portfolio, with HPE Ezmeral Unified Analytics Software and HPE Ezmeral Data Fabric Software, provides comprehensive coverage from the data foundation to the modern analytics stack powered by popular open-source packages that enable customers to have faster time-to-value and accelerate business outcomes.



HPE Ezmeral Unified Analytics Software goes beyond just providing a collection of tools; it offers a fully secure, integrated, and enterprise-ready experience. One of the biggest challenges customers faces is when they try to establish a security framework around open-source tools. Every single access point within HPE Ezmeral Unified Analytics Software is completely protected; whether it is user interaction with the platform itself, or application microservices interacting with other microservices, every component is authenticated. There is security built around every construct using a SPIFFE/SPIRE integration that enables the HPE Ezmeral Unified Analytics Software platform to build a comprehensive zero trust environment. This zero trust model is extended down to the node and all components in between, including the operating system, container images, and so on. In addition to the zero trust authentication, there are also single sign-on, user, application, and data access controls, as well as application-level isolation.

While HPE Ezmeral Unified Analytics Software is a curated collection of tools and frameworks, it is recognized that enterprises may have other open-source tools that they prefer to use or have developed for their unique needs. HPE Ezmeral Unified Analytics Software provides the powerful capability to easily onboard other open-source tools into the platform, whether custom OS or third-party ISV tools. This allows the same observability, monitoring, alert logging, single sign-on, and zero trust workload security as part of the integrated set of unified analytics tools. All these capabilities are inherited by the tools and frameworks that are brought into the integrated platform. Figure 1 provides an overview of the features, functions, and capabilities of HPE Ezmeral Unified Analytics Software.



**Figure 1.** HPE Ezmeral Unified Analytics—A modern data analytics architecture

HPE Ezmeral Unified Analytics Software brings a collaborative and simple user experience to data engineering and data science tooling, along with advanced analytics software foundations delivered as a managed service with consumption-based pricing in a true hybrid/multicloud deployment.

## Data engineering

Data engineers build systems that collect, manage, and convert raw data into usable information for data analysts, data scientists, and business intelligence (BI) applications to consume. A primary function is to make various data sources accessible to HPE Ezmeral Unified Analytics Software and this process is called extract, transform, and load (ETL). This process combines data from multiple sources into a large, central repository. It uses a set of business rules to organize raw data and prepare it for storage, data analytics, and machine learning (ML). It may also involve data cleansing and data conversion to prepare the data. One of the most extensively used open source tools for data engineering is Apache Airflow.

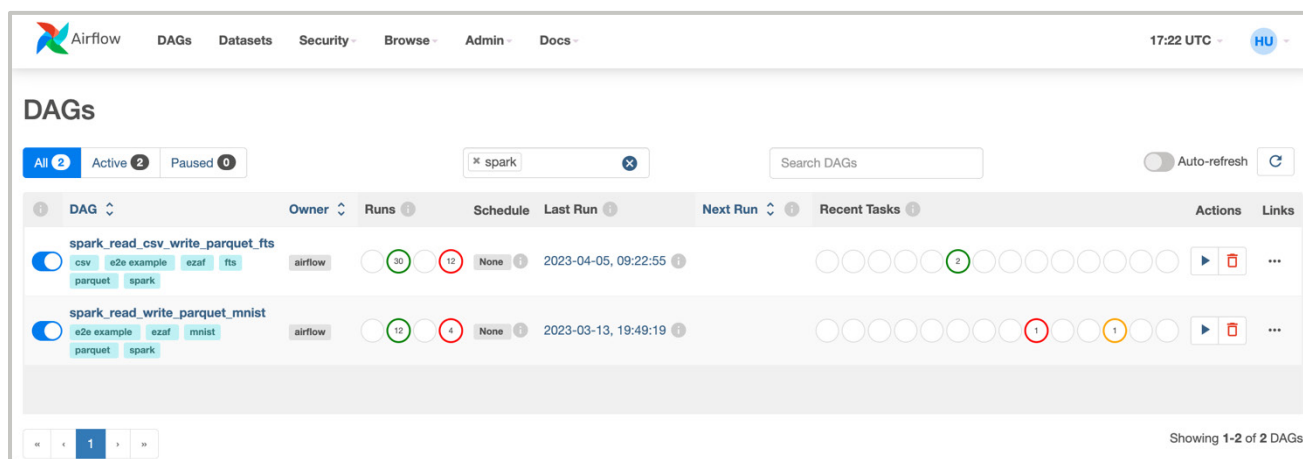
## Apache Airflow

Apache Airflow is an open-source workflow management platform for data engineering pipelines. The HPE Ezmeral Unified Analytics Software fully integrates Airflow with other integrated frameworks and tools accessed through the single user interface. It implements Airflow to author, schedule, or monitor workflows and data pipelines. The workflows are started on a schedule or triggered by an event. Directed acyclic graphs (DAGs) define the order to run or rerun tasks in case of failures.

In HPE Ezmeral Unified Analytics Software, Airflow is implemented and composed of the following parts:

- **Airflow Operator**  
Manages and maintains Airflow Base and Airflow Cluster Kubernetes Custom Resources by creating and updating Kubernetes objects
- **Airflow Base**  
Manages the PostgreSQL database that stores Airflow metadata
- **Airflow Cluster**  
Deploys the UI and scheduler components of Airflow

In HPE Ezmeral Unified Analytics Software, there is only one instance of Airflow per cluster, and all authenticated users access Airflow DAGs. Airflow DAGs in HPE Ezmeral Unified Analytics Software can only be read from a GitHub repository on a specified branch from a specified subdirectory. Both private and public GitHub repositories are supported.



**Figure 2.** Is an example screenshot of the DAGs that have been created in Airflow with HPE Ezmeral Unified Analytics Software. The first DAG is an example of a workflow that reads a CSV and then uses Spark to write it out in Parquet format

## Data sources

HPE Ezmeral Unified Analytics Software can simply and quickly connect to multiple internal and external data sources. These connections are established with Presto connectors so that they can be easily explored with federated SQL queries. Data engineers and analysts can establish connections to external data sources containing the data sets (tables and views) they want to work with a Java Database Connectivity (JDBC) connection URL and the appropriate user credentials are all required to create a connection. The currently supported external data sources that can be connected to the software are Hive, CSV, Parquet, SharePoint, Snowflake, SQL Server, Drill, Delta Lake, MySQL, PostgreSQL, Teradata, and Oracle.

From within the HPE Ezmeral Unified Analytics Software dashboard user interface, you can browse the connected data sources using the data catalog and data sets within the selected data sources. To add new data sources, the create button on the appropriate tile and a dialogue box appear (see Figure 3).



**Figure 3.** Adding a new data source to HPE Ezmeral Unified Analytics

Once a data source is connected, it is immediately available to all the apps in the platform, making it easy for data engineers to design, build, and manage data pipelines and establish workflows within the same Unified Analytics platform.

### Query editor—Presto

HPE Ezmeral Unified Analytics Software has an in-built query editor, which has been optimized to run federated queries across various connected data sources. The query engine is based on the open-source, Linux® foundation multi-parallel processing (MPP) query engine Presto, which has rapid query performance. Data sources can be selected for caching while establishing the connection to improve query performance. When Generic Cache Enabled is selected, the system caches remote table data to accelerate queries on the tables. The cache is active for the duration of the configured TTL or until the remote tables in the data source are altered. When you opt to cache data sets, you can modify the data sets prior to caching them. For example, you can edit table and column names, remove columns, and create new schema. Cached data sets (tables and views) are accessible in the Cached Assets space of the software.

### Superset

Superset is a cloud-native business intelligence web application that collects and processes large data volumes that can be used in the data visualizations and dashboards that you create within it. When you connect HPE Ezmeral Unified Analytics Software to various data sources, you can access the data in those data sources from Superset. For example, you can create any type of chart in Superset and specify query conditions on a selected data set to visualize the query results in the chart. Superset works with Presto, the HPE Ezmeral Unified Analytics Software accelerated SQL query engine, to process the query and display results. The Presto database unifies the data sources connected to HPE Ezmeral Unified Analytics Software. The unified data source connection enables you to:

- Add the data sets you create in the HPE Ezmeral Unified Analytics Software data engineering space to Superset.
- Connect Superset directly to the Presto database for direct access to the unified data sources.

You can also connect Superset to external databases (not part of the unified data source connection in HPE Ezmeral Unified Analytics Software).

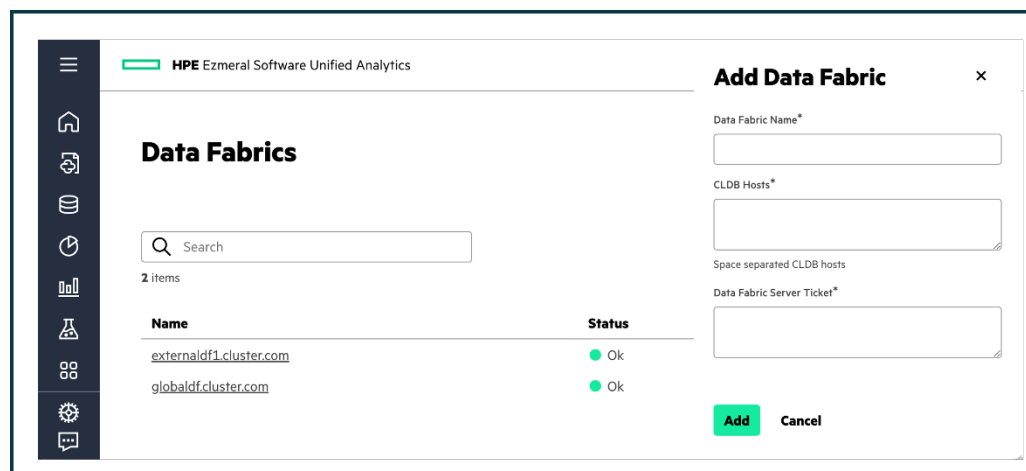
### Data fabric

#### Transient storage

Unlike native open-source analytics tools, HPE Ezmeral Unified Analytics Software is bundled with a modernized data fabric layer to provide a seamless, connected experience. The built-in scalable data fabric provides internal data storage capability and supports various data types. This integrated transient storage negates the need for data analysts and scientists to instantiate and configure the storage that they may need while performing their work within the platform. This storage is an integrated part of the initial installation of unified analytics. However, it can be administered and modified subsequently if needed and is accessible to all apps and users on the platform.

## External data fabric

In addition to external data sources such as MySQL, Snowflake, and such, HPE Ezmeral Unified Analytics Software can connect to external HPE Ezmeral Data Fabric Software deployments. An externally attached data fabric helps data engineers access, manage, organize, and govern enterprise data across multiple locations and formats by providing a single, consistent, easy-to-use, and edge-to-cloud data plane optimized for analytics workloads. Figure 4 is a screenshot of how to add an HPE Ezmeral Data Fabric to HPE Ezmeral Unified Analytics.



**Figure 4.** Adding a new data source to HPE Ezmeral Unified Analytics

## Data analytics

HPE Ezmeral Unified Analytics Software provides a single place where data engineers and data scientists can run analytical workloads through the Apache Spark Operator, interactive sessions in Apache Livy, and schedule jobs using Apache Airflow.

### Spark

HPE Ezmeral Software Unified Analytics provides an enterprise-ready Spark experience where data engineers, data analysts, and data scientists can run analytical workloads through the Apache Spark Operator, interactive sessions in Apache Livy, and schedule jobs using Apache Airflow. It is a unified analytics engine with high data processing speed that offers high-level APIs in Java, Scala, Python, and R. Spark provides the in-memory computing and optimized query implementation for fast data processing. HPE Ezmeral Unified Analytics Software Spark operator is agnostic to the Spark version, and it supports using Docker images with any platform version.

Spark in HPE Ezmeral Unified Analytics software supports the following features and functionality:

- Atomicity, consistency, isolation, and durability (ACID) transactions for Spark applications with Delta Lake
- Spark jobs from the HPE Ezmeral Software Unified Analytics UI using the following components:
  - Spark Operator
  - Livy to create interactive sessions
  - Airflow to schedule Spark jobs
- Details for both Spark applications and Livy sessions are stored in Spark History Server.
- Spark applications and Livy sessions are preconfigured so that both user and shared volumes are mounted and are optimized. These folders can also be used to pass files into Spark applications.
- Dynamically set user context to prevent impersonation calls for better security.

The HPE Ezmeral Unified Analytics Software implementation of Spark has several advantages over the public Apache Spark release. It is built with various profiles and includes many integrations out-of-the-box, including Hive, K8s, Kafka, HBase, and Hadoop. It is also fully integrated with HPE Ezmeral Data Fabric Software and supports the data fabric implementation of Simple Authentication and Security Layer (SASL), NoSQL database, and the Open JSON Application Interface (OJAI).

ACID transactions for Spark applications are supported out of the box with Delta Lake, which has a well-defined open protocol that provides ACID transactions to Apache Spark applications.





Spark Operator

When using the Spark Operator, the Spark application files are in either the user directory (unique for each user) or a shared directory. These can be viewed from within the HPE Ezmeral Unified Analytics platform as shown in Figure 5.

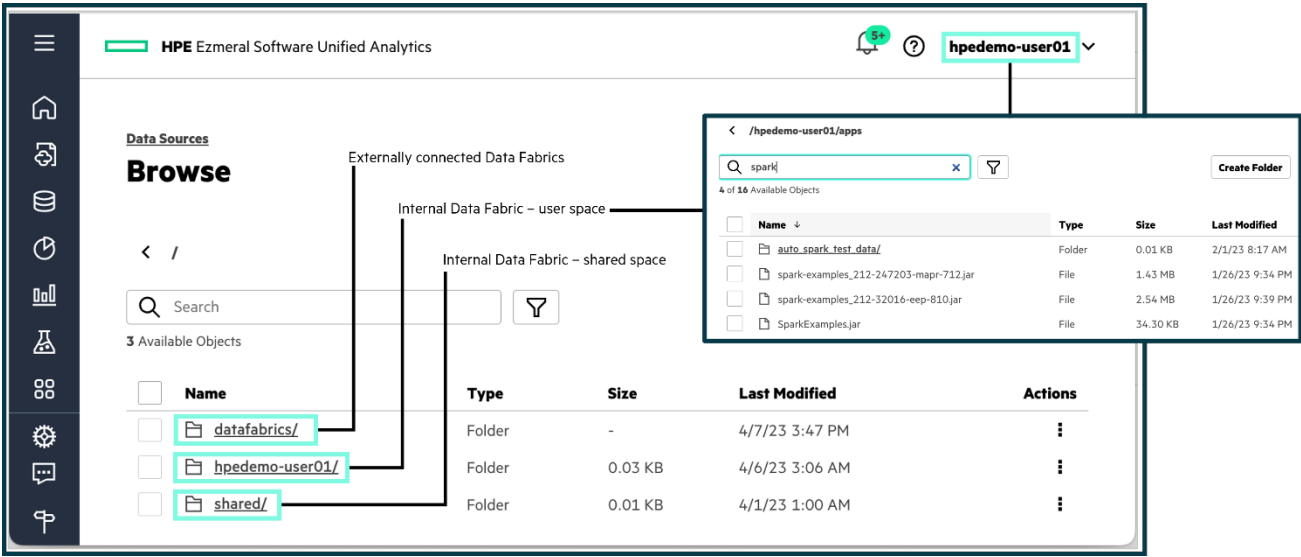


Figure 5. Location of Spark applications

Spark Interactive—Apache Livy

In addition to using the Spark operator, data engineers, data analysts, and data scientists can run analytical workloads via an interactive Spark session with Apache Livy. One advantage over native open-source Livy is that HPE Ezmeral Unified Analytics Software supports Livy in a Kubernetes environment; open-source Apache Livy does not support K8s. An Apache Livy interactive session can be initiated from the Data Analytics menu bar or within Applications and Frameworks by going to the Data Analytics tab and clicking the Livy tile.

Spark—Airflow

From within HPE Ezmeral Unified Analytics Software, a Spark application can be run from Airflow with a DAG. The user can then run a Jupyter Notebook to analyze and visualize data that the Spark application puts into a shared directory in the shared volume to which the data scientist’s notebook is mounted. See the example in Figure 6 for using Spark to convert a .csv file to parquet format.

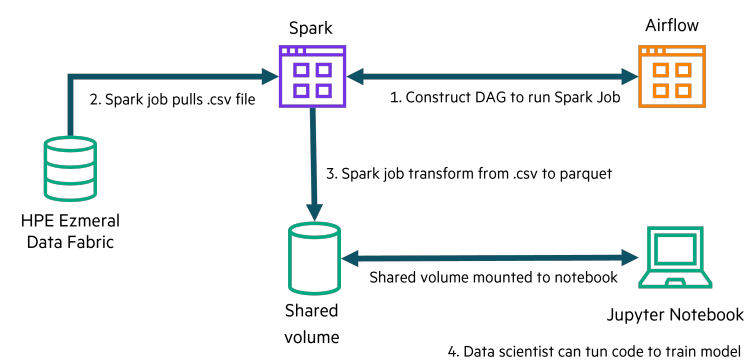


Figure 6. Location of Spark applications

Spark History Server

The Spark History Server is a monitoring service for Spark workloads. Both Spark controllers in HPE Ezmeral Unified Analytics Software (Operator and Livy) pre-configure Spark applications automatically to integrate with the installed Spark History Server. It contains information about in-progress and complete Spark applications and Livy sessions. By default, Spark workload details can be viewed only by the user who effectively submitted it. If a user wants to share details with other users—they can add “allowed users list” via Spark.





## Data science

Data scientists can build, train, and deploy ML models in HPE Ezmeral Unified Analytics Software using open-source ML tools that optimize the performance of predictive ML models.

### ML tooling

ML tools are algorithmic applications that let systems learn and improve without constant human input. They allow the software to become more accurate in predicting outcomes without being explicitly programmed. HPE Ezmeral Unified Analytics Software incorporates the most popular ML tooling platforms, Kubeflow and MLflow.

By default, MLflow is used primarily for model tracking and as the model registry, and Kubeflow is used for creating notebooks, model training, pipelines, and model serving.

### MLflow

MLflow is an open-source platform that manages the end-to-end ML lifecycle, including experimentation, reproducibility, deployment, and a central model registry. With HPE Ezmeral Unified Analytics Software, you can train your ML model and run experiments in a fully managed, secured, and unified environment.

The model management framework with MLflow integration in HPE Ezmeral Unified Analytics Software has the following capabilities.

- **Notebook integration**  
Build and train ML models using MLflow APIs with an underlying tracking server
- **Experiment tracking**  
Track experiments and compare the output parameters for various runs
- **MLflow models**  
Enable users to log all parameters, save artifacts, load models, and deploy models
- **Model artifacts**  
Log parameters and save model artifacts to HPE Ezmeral Data Fabric Object Store

### Kubeflow

Kubeflow is a platform that can be used to develop and deploy ML workflows using Kubeflow components. With HPE Ezmeral Unified Analytics Software, you can create Kubeflow pipelines, manage Katib experiments, and serve ML models in a fully managed, secured, and unified environment.

Kubeflow can also create and manage interactive development environments via notebook servers. The notebook server currently supported in HPE Ezmeral Unified Analytics Software is JupyterLab.

Kubeflow in HPE Ezmeral Unified Analytics Software supports the following features and functionality:

- A seamless SSO login experience for authorization and authentication
- A default notebook is created with TensorFlow™ image by using Kubeflow Notebooks
- A default user volume is created in Kubeflow notebooks, where only the current user has access to the data stored in the user folder
- Kubeflow notebooks contain a shared directory with all the notebook examples that all the authorized users can access
- Model serving using KServe

### Feast

Within HPE Ezmeral Unified Analytics Software, Feast is used as the feature store. Feast configures data infrastructure for serving ML features and operationalizing a ML model. Feast tracks and defines feature metadata and enables the reusing and sharing of features across multiple teams.



**Ray**

Within HPE Ezmeral Unified Analytics Software, Ray is a unified framework for scaling AI/ML and Python applications, handling distributed workloads, and parallelizing serial applications.

Ray Core provides core primitives to build and scale distributed applications. The core primitives are:

- Tasks
- Actors
- Objects

Ray in HPE Ezmeral Software Unified Analytics supports the following features and functionality:

**Notebook Integration**

A pre-existing image is created in Kubeflow notebooks with Ray library. To submit jobs using Ray, you can connect to Ray cluster.

**Ray dashboard**

Ray dashboard in HPE Ezmeral Software Unified Analytics allows you to:

- Understand Ray memory utilization and debug memory errors
- See per-actor resource usage, implemented tasks, logs, and more
- View cluster metrics
- Terminate actors and profile your Ray jobs
- See errors and exceptions immediately
- View logs across many machines in a single pane
- See Ray Tune jobs and trial information

**Operational systems**

Once models have been developed, trained, and validated, operational systems focus on monitoring the current and real-time operations. Operational systems employ real-time data analysis and business intelligence to boost productivity and streamline daily operations.

**Inferencing**

Machine learning (ML) inference runs live data sets into an ML model to calculate an output such as a single numerical score. This process is also referred to as “operationalizing an ML model” or “putting an ML model into production.” When ML inference is running in production, it is sometimes described as artificial intelligence (AI) since it performs functions similar to human thinking and analysis.

**KServe**

The Kubeflow KServe is a standard model inference platform built for highly scalable use cases. It provides a performant, standardized inference protocol across ML frameworks. KServe downloads and deploys a model from object storage and makes the model accessible through a web service endpoint.

**BI reporting**

BI reporting tools source data from an enterprise’s hybrid data repositories, be it at the edge, on-prem, or in the cloud. Within HPE Ezmeral Unified Analytics Software, the main BI Reporting tool is the dashboard function within Apache Superset.



Platform services

Open and extensible

HPE Ezmeral Unified Analytics Software allows developers to focus on their work by giving them self-service access to the most popular open source tools and making accessing data from edge to cloud seamless. This helps eliminate system/IT bottlenecks and vendor lock-in, giving developers best-of-breed options with full enterprise-grade support that HPE is known for.

However, HPE Ezmeral Unified Analytics Software can also easily onboard other open-source tools and frameworks into the platform, whether custom OS or third-party ISV tools. The same observability, monitoring, alert logging, single sign-on, and zero trust workload security capabilities of the integrated tools are inherited by these on-boarded tools when they are brought into the platform.

From within the HPE Ezmeral Unified Analytics Software dashboard, simply select “Applications and Frameworks” and click “Import Application” from the Data Engineering tab; see Figure 7.

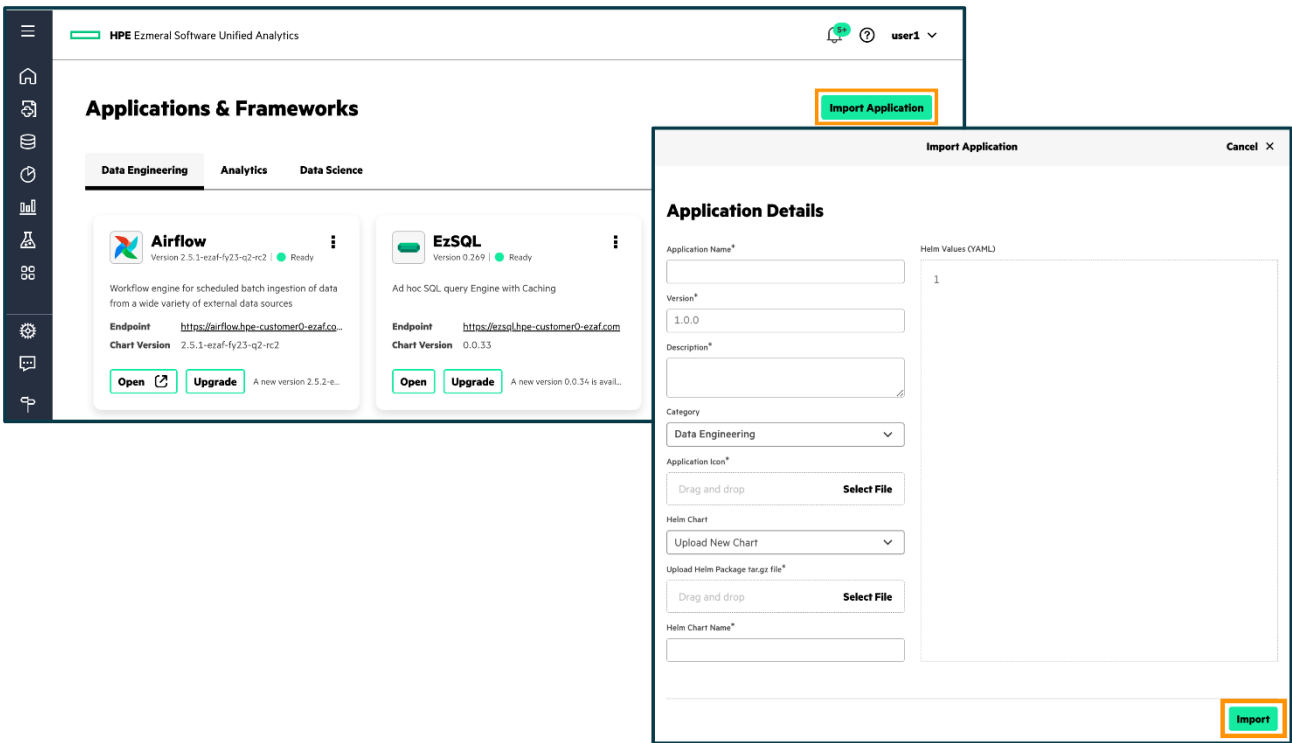


Figure 7. On-boarding custom open-source tools or third-party ISV tools into the HPE Ezmeral Unified Analytics platform

Observability

HPE Ezmeral Unified Analytics Software collects the service and node monitoring metrics and stores them in Prometheus. It is an internal software application used for event monitoring and alerting that records real-time metrics in a time series database built using an HTTP pull model, with flexible queries and real-time alerting service. HPE Ezmeral Unified Analytics Software will expose the monitoring data using OpenTelemetry (OTel) format. OTel is a vendor-neutral open-source observability framework for instrumenting, generating, collecting, and exporting telemetry data such as traces and metrics. The logging service is like the monitoring service; HPE Ezmeral Unified Analytics Software apps and infrastructure services will publish logs and write to the internal service while exporting the logs in OTel format using an OTel exporter.

Monitoring and alerting

HPE Ezmeral Unified Analytics Software implements the Prometheus alert manager to manage alerts. Prometheus is an open-source system for monitoring and alerting. It can monitor everything from an entire Linux server to a standalone web server, a database service, or a single process. In Prometheus terminology, the things it monitors are called Targets. At a set interval, it pulls (scrapes) targets over HTTP to collect metrics and places the data in its time-series database. You can use the PromQL query language to query metrics about targets. Figure 8 illustrates the HPE Ezmeral Unified Analytics architecture.



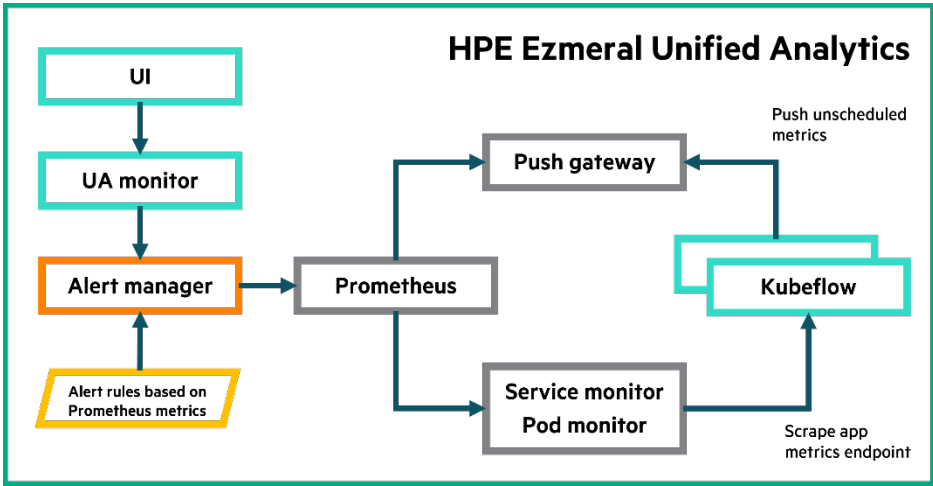


Figure 8. HPE Ezmeral Unified Analytics Software alerting architecture

Alert manager

The alert manager is the alerting component for Prometheus. Prometheus allows us to have rules that should trigger alerts. These rules are based on Prometheus expression language. Whenever a condition is met, the alert is fired and sent to the alert manager. Alert rules are defined in the Prometheus configuration. Prometheus scrapes (pull) metrics from its client application (the node exporter). However, if any alert condition hits, Prometheus pushes it to the alert manager through its pipeline of silencing, inhibition, grouping, and sending out notifications.

- **Silencing** is to mute alerts for a given time. Alerts are checked to match against active silent alerts; if a match is found then no notifications are sent.
- **Inhibition** is to suppress notifications for certain alerts if other alerts are already fired.
- **Grouping** helps group alerts of similar nature into a single notification. This helps prevent firing multiple notifications simultaneously to the receivers like Mail or Slack.

Alerting rules

Alerting rules can be set using configuration files, and applications can drop their alert manager rules files into a specific folder in GitHub.

Figure 9 is a screenshot of the Alerts & Notifications page within the platform. Alerts can be searched, and various actions can be taken on the alerts.

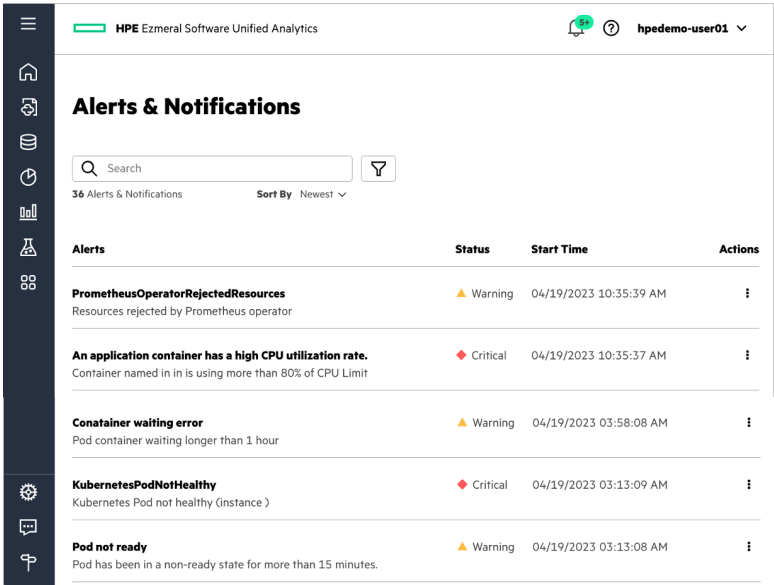


Figure 9. Screenshot of Alerts & Notifications



## Built-in single sign-on and security architecture

HPE Ezmeral Unified Analytics Software supports a single sign-on experience. There are end-to-end, enterprise-grade security features, including zero trust authentication, app-level isolation, as well as user, application, and data access controls that are an integral part of the platform.

### Single sign on (SSO)

HPE Ezmeral Unified Analytics Software acts as an OIDC provider. It can source user information from an external AD/LDAP server, or an internal AD/LDAP server (for demos and POCs), and it will also delegate authentication requests to that server. User identity and other attributes will be presented in well-known claims in the JSON Web Token (JWT) identity token received from the OIDC provider.

There are two aspects to user access in HPE Ezmeral Unified Analytics Software, user access to the platform and the applications within the platform.

### User access to HPE Ezmeral Unified Analytics Software

When HPE Ezmeral Unified Analytics Software is deployed, the admin is given access via the user management service. This admin will have credentials to an internal administrative account on the OIDC provider that has privileges for querying users, managing their enablement, and assigning roles.

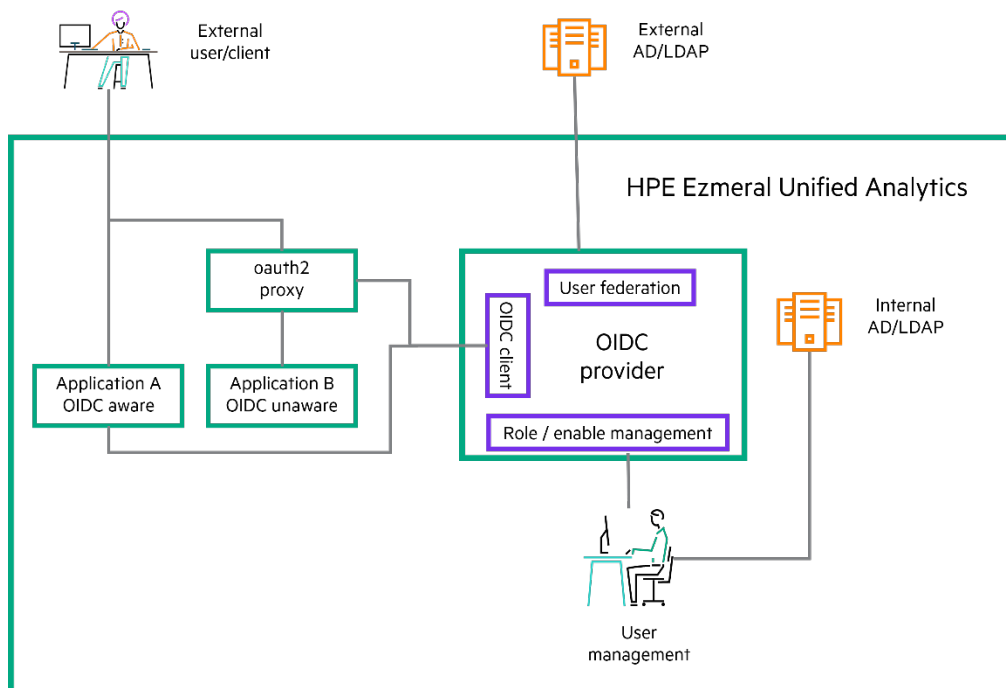
If a new user is given access the admin will search the OIDC provider for user CRs such as first name, last name, email, and more. If there is an external AD/LDAP and the user is sourced from there, the admin will enable a role for the user and is given the token rights for that role. Any addition / removal / modification of users and their attributes must be done in the external AD/LDAP server. If there is an internal AD/LDAP server, the admin will create the user and assign the enabled role.

### User access to the applications within HPE Ezmeral Unified Analytics Software

There are two types of application, those that support OIDC integration and applications that expect to receive authentication or authorization-related assertions in request header values.

Applications with native OIDC integration features will use the OIDC client directly. Unified analytics provides a proxy for apps that don't do their OIDC integration, which will intervene in external user access. This proxy will initiate an OIDC flow when necessary and insert authentication/authorization-related header values (individual claim values, as well as the entire JWT) for consumption by the app. This enables interactive users can switch between apps in unified analytics without re-entering credentials until their login expires.

Figure 10 shows how the SSO process functions within HPE Ezmeral Unified Analytics for external users and clients.



**Figure 10.** User authentication and authorization

Single user interface

Users can access HPE Ezmeral Unified Analytics Software and the applications in the platform in three ways from a single user interface.

From the Data Engineering tab in the main menu bar, various function can be selected Data Sources, Data Catalog, Query Editor, Cached Assets, and Airflow Pipelines. From the Analytics tab, Spark Applications and Spark Interactive Sessions can be initiated. And from the Data Science tab, Kubeflow Pipelines, Experiments, Model Registry, and Model Serving functions can be selected. Refer to the screenshot in Figure 11.

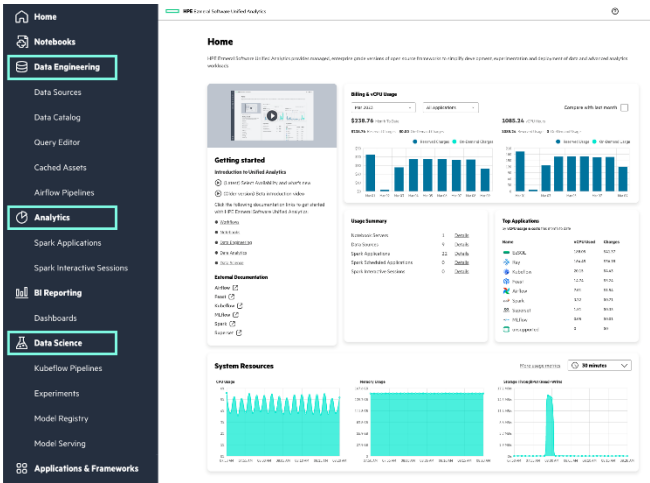


Figure 11. User interface—guided user experience

Figure 12, from the Applications & Frameworks tab shows how to add an application into the platform.

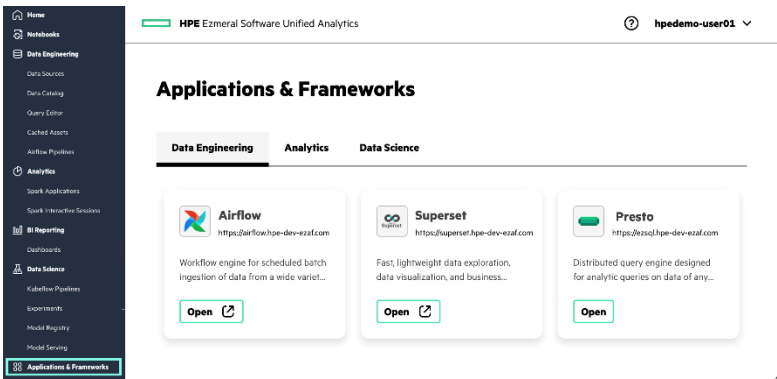


Figure 12. User interface—Applications & Frameworks

Figure 13 is a screenshot from the Notebook tab. The user can see all their Jupyter Notebooks and create a new Notebook server.

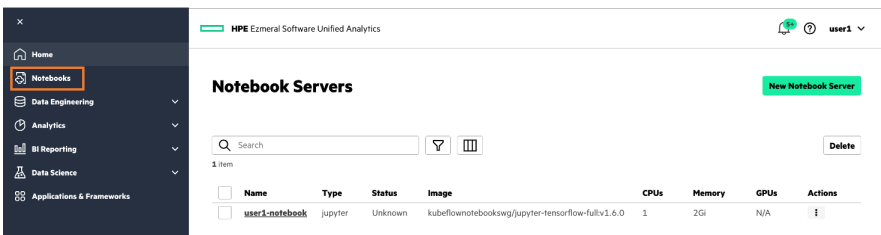


Figure 13. User interface—JupyterLab Notebooks



## Consumption-based pricing

HPE Ezmeral Unified Analytics Software provides customers with a transparent, trackable experience to manage costs and budgets with a cloud-like consumption-based offering. Furthermore, there is added flexibility to conveniently place data and analytics workloads across hybrid environments to help maximize utilization and TCO saving. HPE Ezmeral Unified Analytics Software will collect the resource usage metrics and has an internal service to send the usage data to HPE internal billing service to produce the billing reports. HPE Ezmeral Unified Analytics Software provides an API to share the usage metrics to the consumer (billing service provider). The infrastructure provider can consume the usage metrics to produce the custom reports, but the actual billing reports will be generated by HPE billing software.

## Summary

HPE Ezmeral Unified Analytics Software gives customers the software foundations to develop and deploy analytics applications seamlessly across hybrid cloud environments. It helps customers develop and deploy applications and analytics workloads across hybrid environments with a secure, fully managed open-source SaaS solution that provides curated, enterprise-grade versions of best-of-breed analytics tools with a cloud-like, consumption-based experience.

## Learn more at

[HPE.com/us/en/HPE-Ezmeral-Unified-Analytics.html](https://HPE.com/us/en/HPE-Ezmeral-Unified-Analytics.html)

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