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Europe 2026

#KubeCon #CloudNativeCon

Kubeflow in Cloud Native AI: Orchestrating the Next Wave of Agentic AI and LLMOps



Speakers



Alexander Perlman

Distinguished Engineer

Capital One



Antonin Stefanutti

Principal Software Engineer

Red Hat



Johnu George

Technical Director

Nutanix



Michael Zazula

Lead Machine Learning Engineer

Capital One



Valentina Rodriguez Sosa

Principal AI Architect

Red Hat

Kubeflow Overview



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Kubeflow is a **Foundation of Tools for AI Platforms on Kubernetes**
Kubeflow tools makes **GenAI and LLMOps** simple, portable, and scalable

Kubeflow Overview

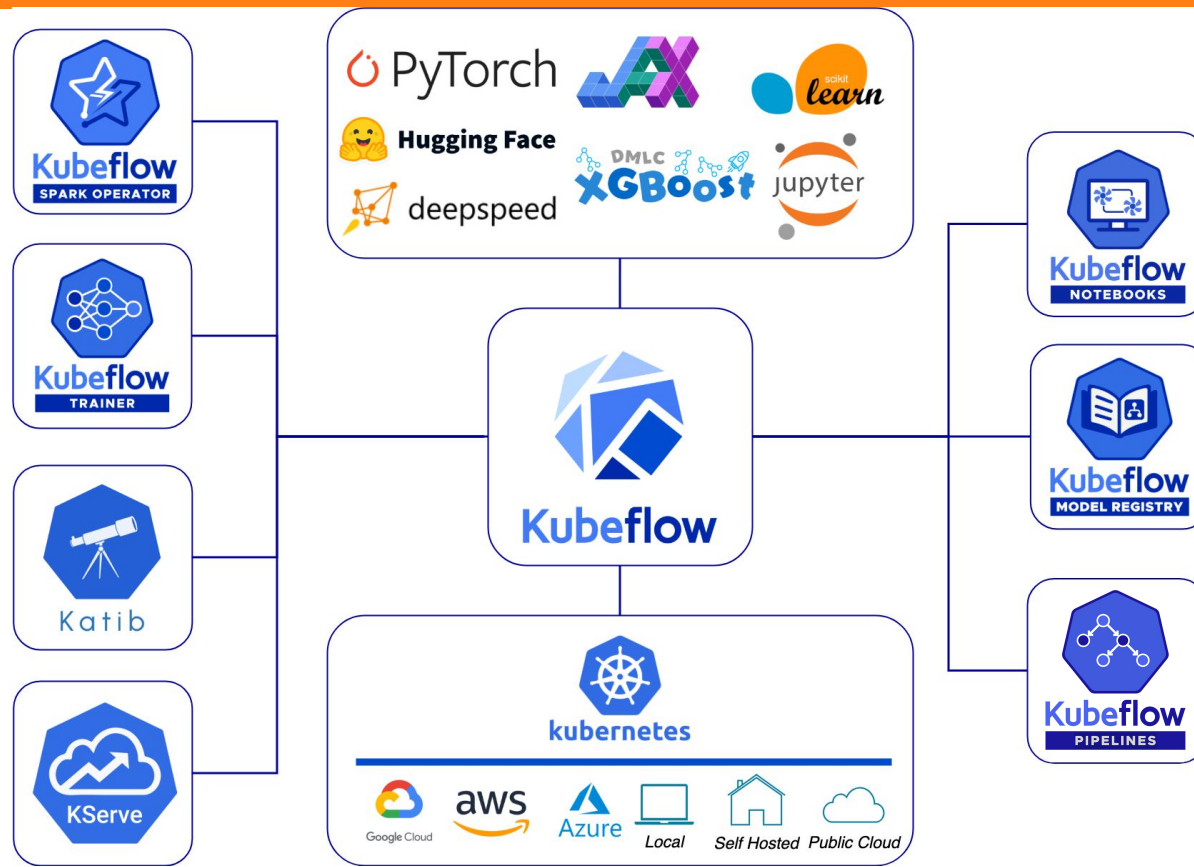


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GenAI Lifecycle with Kubeflow

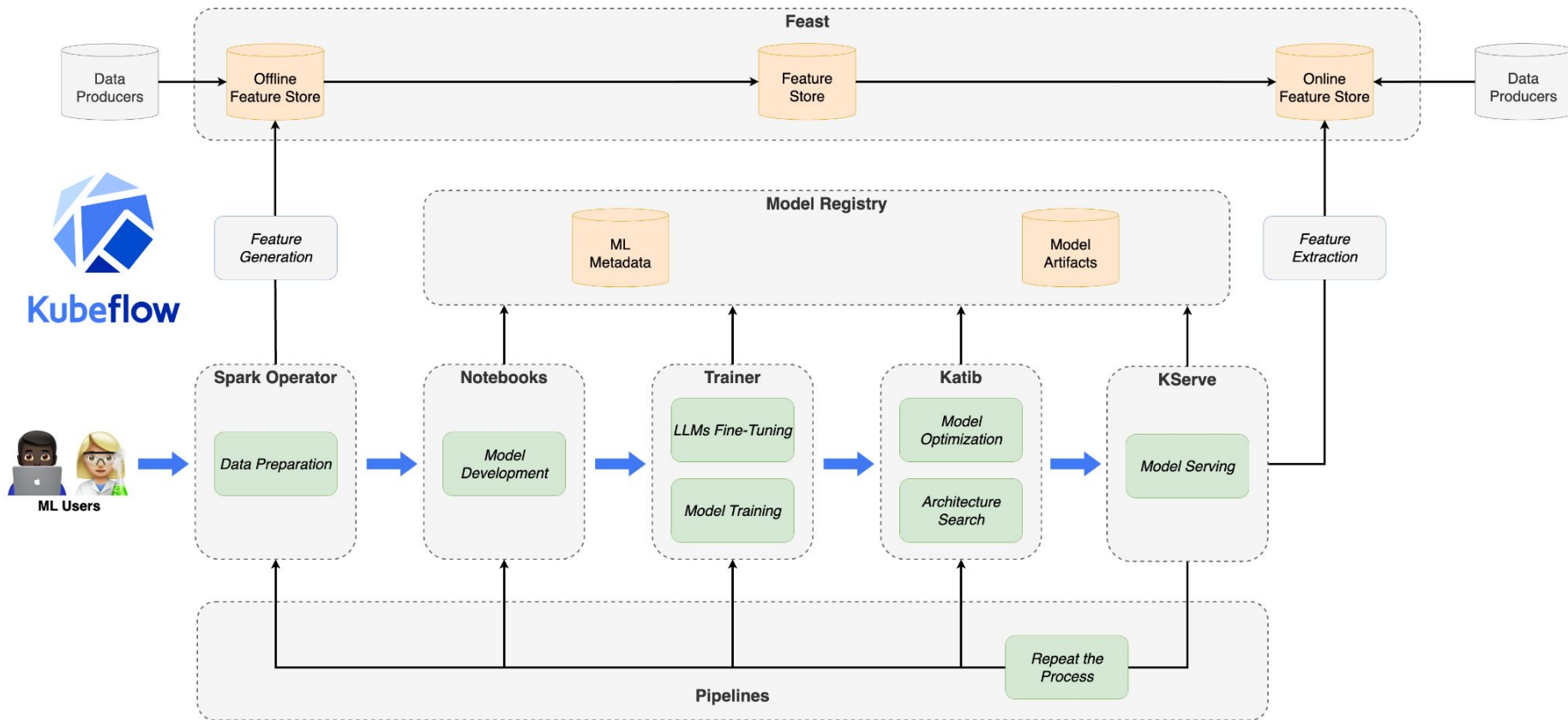


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What is Kubeflow Notebooks



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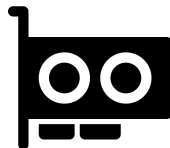
Familiar Tools



Kubernetes



Compute



Standard
Environments



Sharing



Kubeflow Notebooks runs **interactive development environments** for AI, ML, and Data workloads on Kubernetes.

Kubeflow Notebooks 2.0 - Coming Soon



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Persona:

Platform Engineer

Define common workspace templates with options for your users.

- Safely deprecate, and update **options** with pre-built images for your users.
- Scope access and track who is using what **options**. Including expensive GPUs.

Persona:

AI/ML Practitioner

Easily run remote environments (JupyterLab, VSCode, RStudio) without thinking about Kubernetes.

- **Choose** from curated images specific to your company.
- **Choose** from cluster-compatible templates for complex requests like GPUs.

Kubeflow SDK

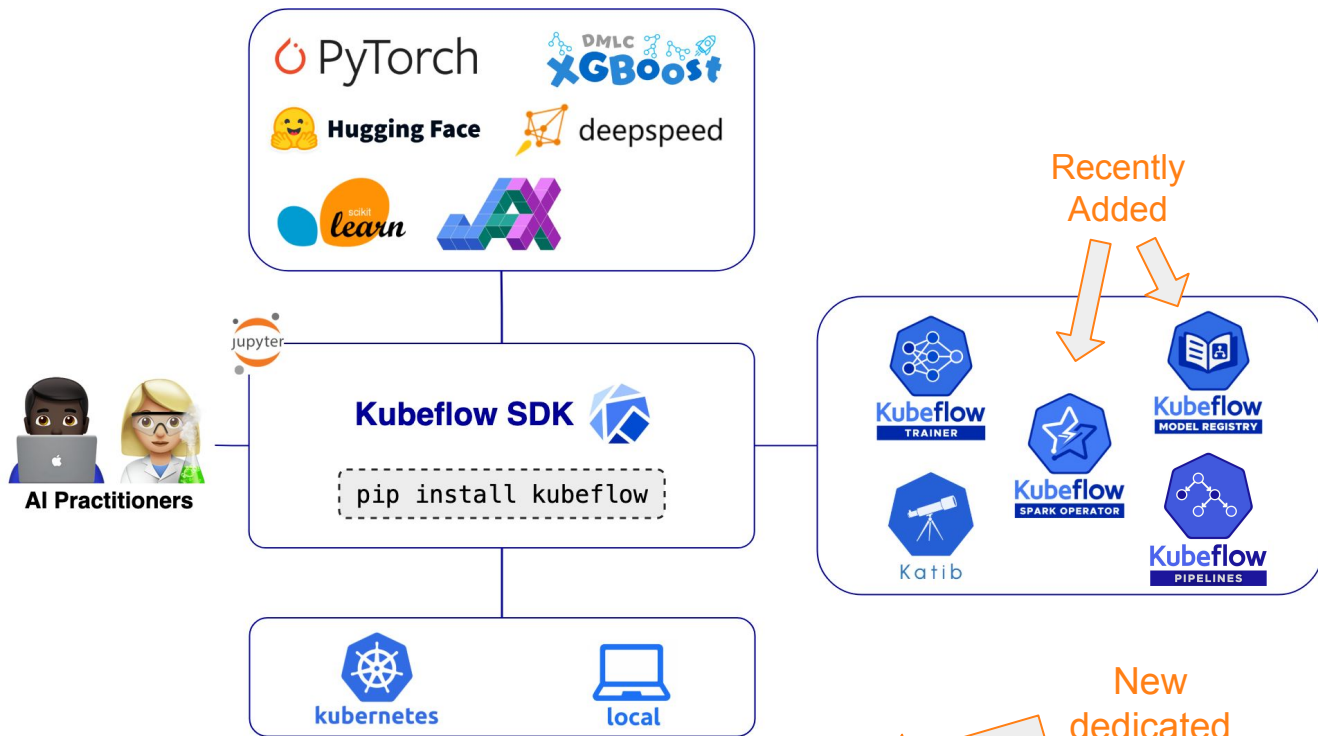


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<https://sdk.kubeflow.org/>

New
dedicated
website!

Kubeflow Model Registry



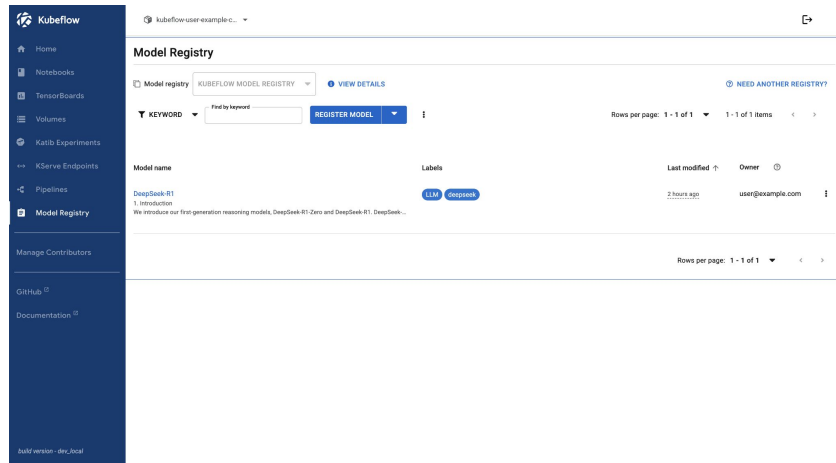
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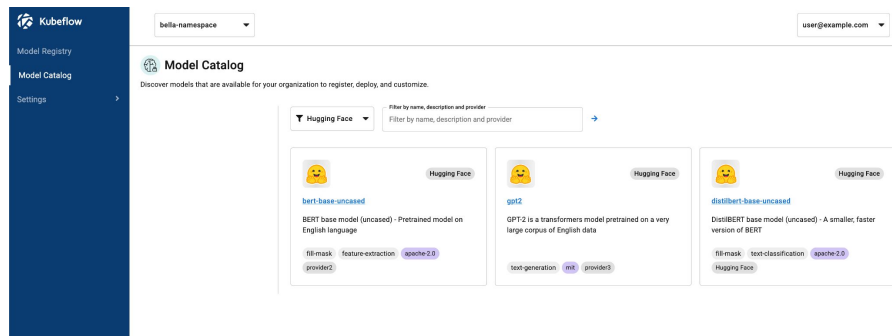
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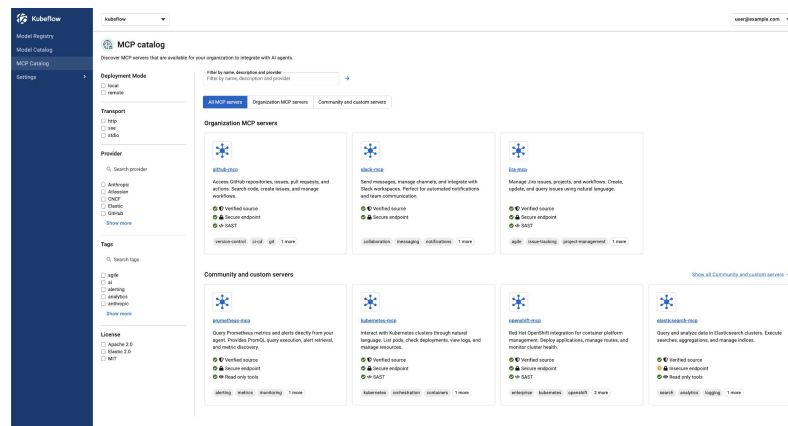
-  **Easy Model Management:** Central and intuitive interface for managing models lifecycle and metadata
-  **Kubeflow Model Registry UI:** User-friendly web interface for centralized model metadata, version tracking & artifact management.
-  **Kubeflow SDK client**
<https://sdk.kubeflow.org/en/latest/hub/index.html>
-  **KServe Integration**
 - Model deployment from metadata
 - Model records from KServe inference services
-  **Sign and verify models**
Integrates with SIGSTORE



- 🚧 Model Catalog and UI
- Model discovery & sharing with governance
- Integration with external sources e.g. Hugging Face, etc



- 🚧 MCP catalog



Kubeflow Trainer

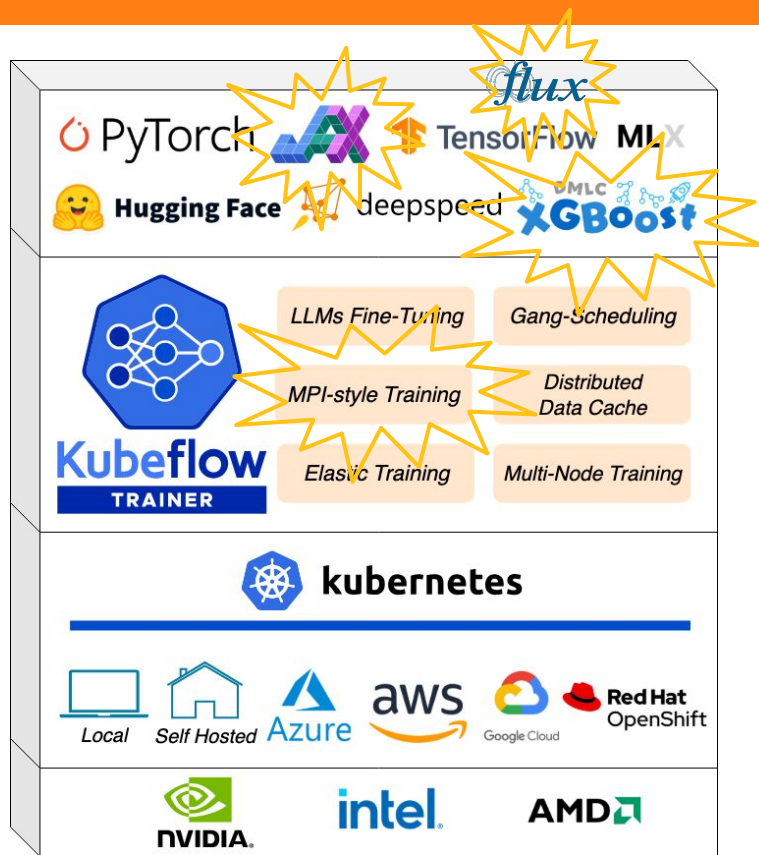


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- ✨ **Kubernetes API**
 - **TrainJob** - unified training job API replacing framework-specific CRDs
 - **[Cluster]TrainingRuntime** - separate infrastructure configuration resource from job definition
- 🧑 **Pythonic SDK**
 - `pip install kubeflow` – no YAML required
 - Local execution mode for development
- 🔥 **Helm Charts**

```
helm install kubeflow-trainer
oci://ghcr.io/kubeflow/charts/kubeflow-trainer
--version 2.2.0
```
- 🔥 **Documentation website**
<https://trainer-doc-website.readthedocs.io/>

Kubeflow Trainer



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```
$ kubectl get trainjob progress-demo -o jsonpath='{.status.trainerStatus}' | jq
```

```
{
  "progressPercentage": 92,
  "estimatedRemainingSeconds": 10,
  "metrics": [
    {"name": "loss", "value": "0.00076"},
    {"name": "learning_rate", "value": "5.5e-06"},
    {"name": "current_step", "value": "92"},
    {"name": "total_steps", "value": "100"}
  ]
}
```

Real-time progress, metrics, and ETA — directly from kubectl

[Kubeflow Trainer Observability: Real-Time Progress Tracking for Reliable ML Training on Kubernetes - Abhijeet Dhumal & Rob Bell, Red Hat](#)

Kubeflow Trainer

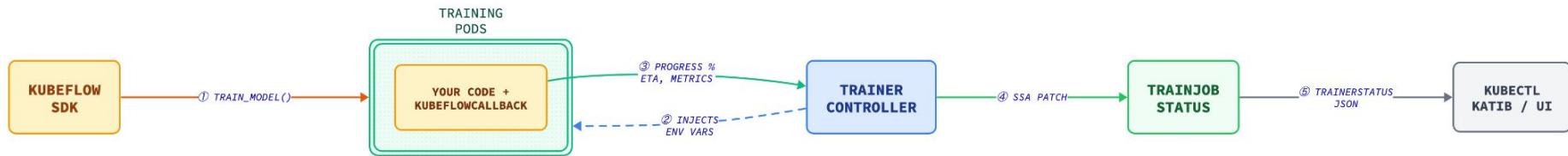


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WIP	Coming Soon
Real-time progress tracking	Trainer UI Dashboard
Katib integration	Checkpoint/Restore (#2245)
Zero-code Hugging Face support https://github.com/huggingface/transformers/pull/44487	Elastic TrainJobs (#2903)

Kubeflow Trainer Observability: Real-Time Progress Tracking for Reliable ML Training on Kubernetes - Abhijeet Dhumal & Rob Bell, Red Hat

Kubeflow Optimizer - Katib



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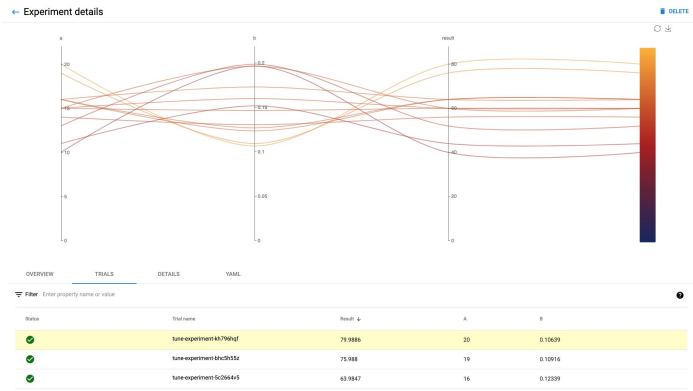
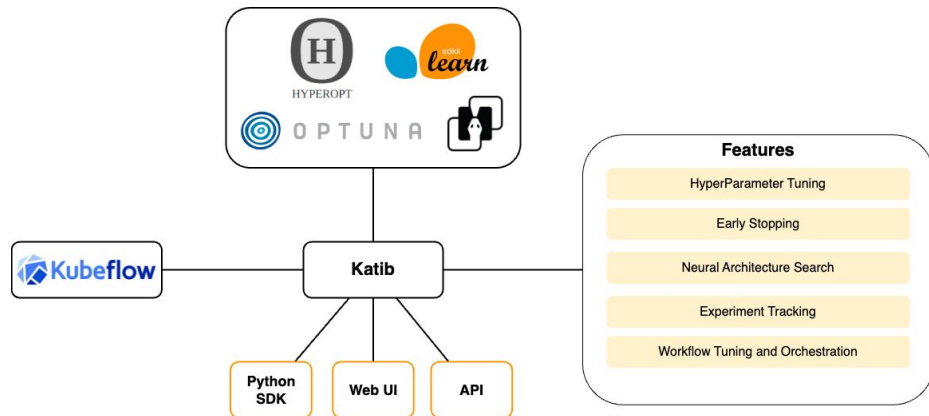
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- Kubernetes-native AutoML
- 🔥 Trainer Integration
 - Run hyperparameter tuning experiments with the **TrainJob** API
- 🧑‍💻 Kubeflow SDK client

```
pip install kubeflow
```

<https://sdk.kubeflow.org/en/latest/optimize/index.html>



Kubeflow Spark



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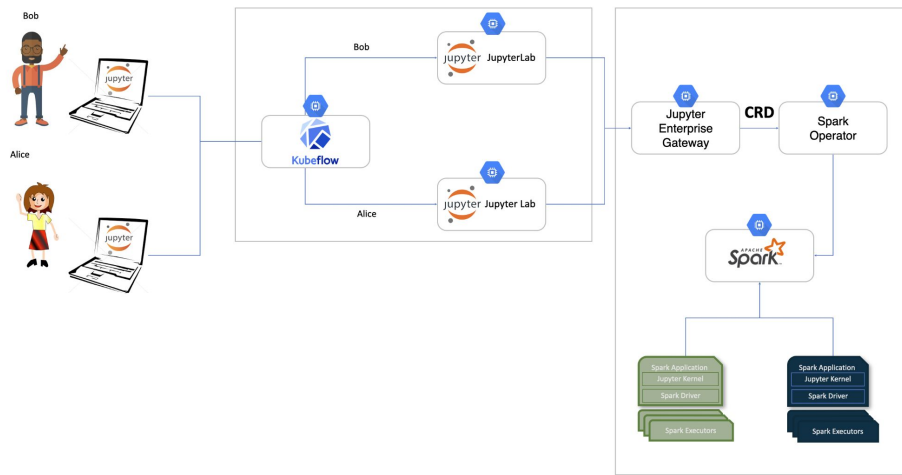
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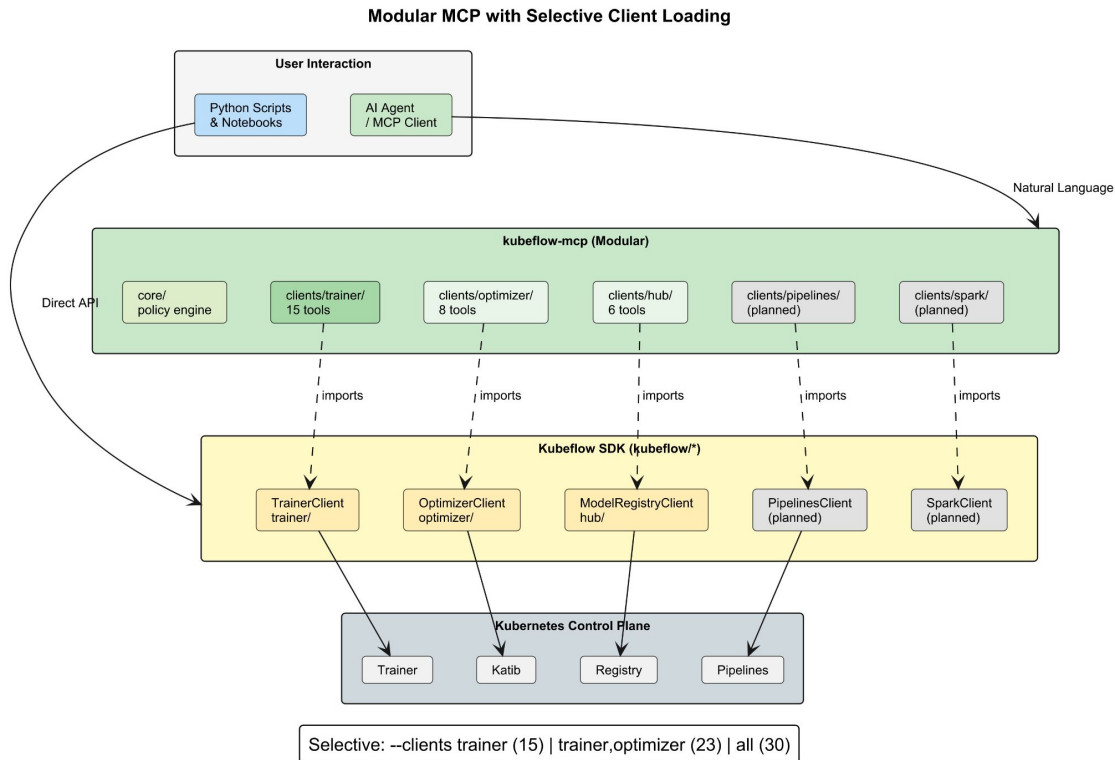
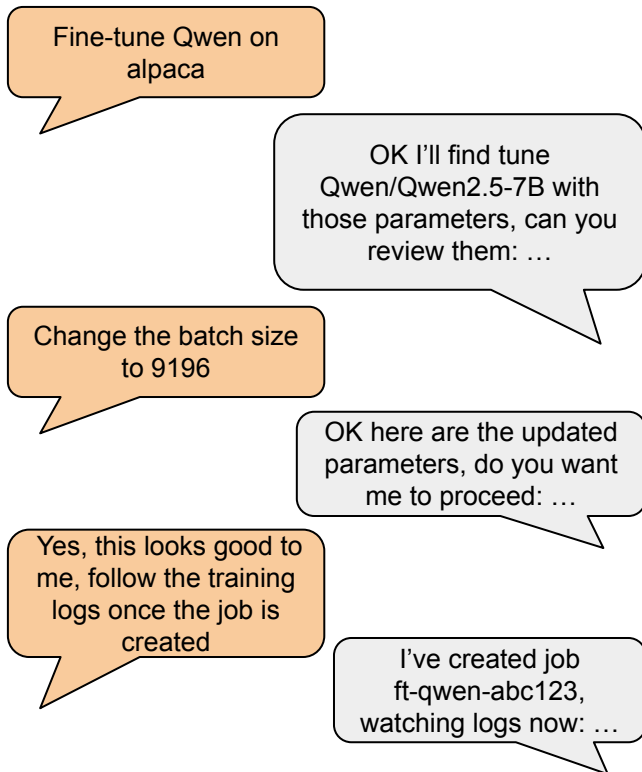
- ✨ Run scalable data processing jobs on Kubernetes with Apache Spark
- ● Support Spark v4
- ● Batch Spark jobs via `SparkApplication` CRD
- 🔥 New `SparkConnect` CRD for interactive development
- 🔥 Kueue integration for `SparkApplication`
- 🔥 Notebook integration with Jupyter Enterprise Gateway: run PySpark code remotely
- 🔥 Kubeflow SDK client

```
pip install "kubeflow[spark]"
```

<https://sdk.kubeflow.org/en/latest/spark/index.html>



Coming soon: Kubeflow MCP



[KEP-936: Introduce Kubeflow-MCP proposal](#)

- Focus on GenAI
 - Standardized interface: OpenAI compatible protocol
 - Model cache
 - Kv cache offloading
 - KV aware routing
 - Custom storage support including Huggingface
 - Accelerator support
- New CRD for distributed inference - LLMISvc
 - Separate helm package and controller deployment
 - Autoscaler support
 - LWS as the orchestrator

Kubeflow Pipelines



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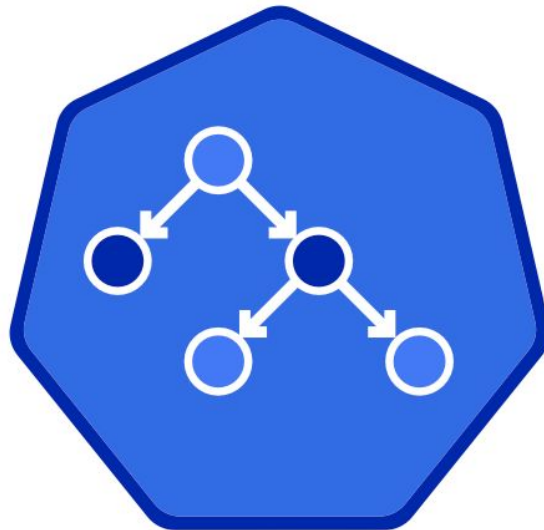
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Kubeflow Pipelines is a Kubernetes-native workflow orchestration engine for machine learning workloads.

KFP maintainers not present today:

- Humair Khan
- Matt Prahl
- Chen Sun



Kubeflow
PIPELINES

SeaweedFS



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<https://github.com/seaweedfs/seaweedfs>

- **PRs**

- <https://github.com/kubeflow/pipelines/pull/11965>
- <https://github.com/kubeflow/pipelines/pull/12613>
- <https://github.com/kubeflow/pipelines/pull/12792>

- **Contributors**

- @akagami-harsh
- @juliusvonkohout

Kubernetes Native API



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- **PRs**

- <https://github.com/kubeflow/pipelines/pull/11551>
- <https://github.com/kubeflow/pipelines/pull/11774>
- <https://github.com/kubeflow/pipelines/pull/11881>

- **Contributors**

- @mprahl
- @rimolive

Artifact and notebook injection



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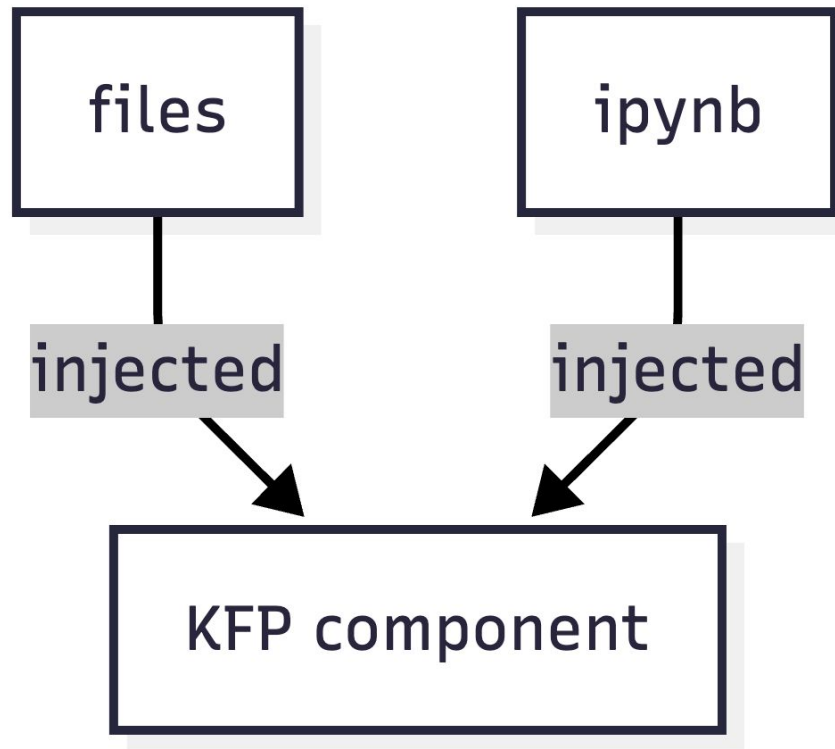
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- **PRs**
 - <https://github.com/kubeflow/pipelines/pull/12294>
- **Contributors**
 - @mprahl

```
from kfp import dsl

@dsl.component(embedded_artifact_path="bar.py")
def comp1():
    from bar import bar_func
    bar_func()

@dsl.notebook_component(notebook_path="nb.ipynb")
def comp2()
    dsl.run_notebook()
```



Arm64 Support



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- **PRs**
 - <https://github.com/kubeflow/pipelines/issues/12727>
- **Contributors**
 - @ShreyasN707
 - @jtu-ampere
 - @hpurdom
 - @Ya-shh

dsl.Collector for Params and Artifacts



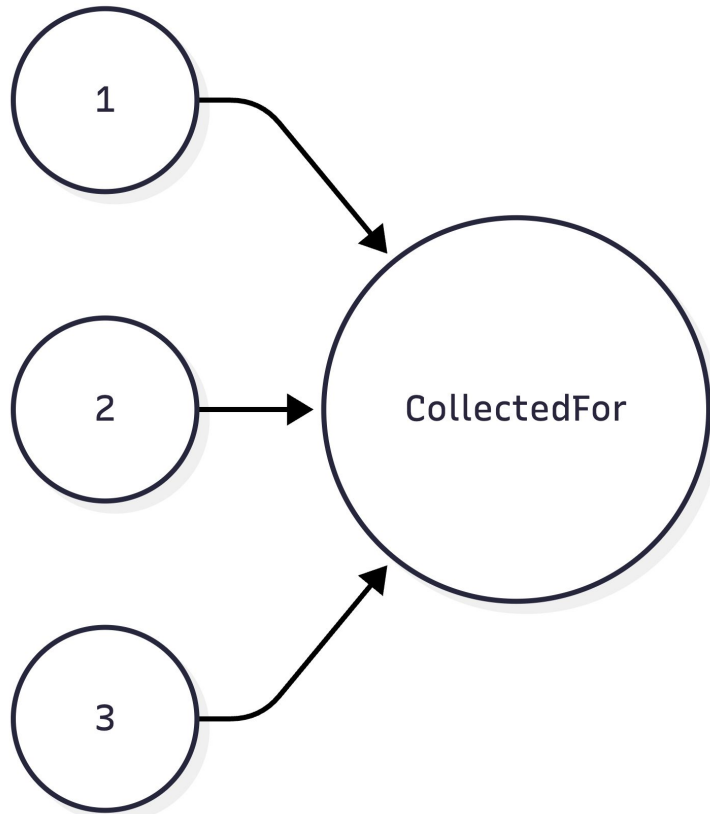
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- **PRs**
 - <https://github.com/kubeflow/pipelines/issues/11725>
- **Contributors**
 - @zazulam



Driver Centralization

- **PRs**
 - <https://github.com/kubeflow/pipelines/pull/12269>
- **Contributors**
 - @ntny

MLMD Deprecation



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- **PRs**
 - <https://github.com/kubeflow/pipelines/pull/12430>
- **Contributors**
 - @HumairAK

Plugin Architecture

- **PRs**
 - <https://github.com/kubeflow/pipelines/pull/12700>
- **Contributors**
 - @HumairAK

MLFlow Native Plugin



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- **PRs**
 - <https://github.com/kubeflow/pipelines/pull/12862>
- **Contributors**
 - @mprahl

Consolidated Python Packages



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Today

v3 release

kfp-pipeline-spec
kfp-server-api
kfp
kfp-kubernetes



kfp

New pipelines-components repository



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<https://github.com/kubeflow/pipelines-components>

- Contributors
 - @mprahl
 - @gmfrasca
 - @hbelmiro

Next Get Involved

 [Kubeflow Community - YouTube](#) and [Kubeflow - YouTube](#)

 [Kubeflow | Bluesky](#) [Kubeflow | LinkedIn](#)

 [Kubeflow | Twitter](#)



Future Events



Community



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