



# Build better AI models— faster

HPE Machine Learning Development Environment





## Removing the complexity and cost associated with machine learning model development

### Adopt the fastest and easiest way to build machine learning models

Train models faster—in hours and minutes, not days and weeks—build more accurate models, manage GPU costs, and track and reproduce experiments with HPE Machine Learning Development Environment. Built upon open source Determined Training Platform, this solution helps you focus on innovation by removing the complexity and cost associated with machine learning model development. Build models, not infrastructure.

### Giving ML engineers what they really need—right now

Machine learning (ML) engineers and data scientists are on a never-ending search for new solutions that will enable them to better focus on innovation and accelerate their time to production—and this is what the HPE Machine Learning Development Environment is all about.

By removing the complexity and cost associated with ML model development, this comprehensive platform speeds time to value for model developers by:

- Removing the need to write infrastructure code
- Making it easier for IT administrators to set up, manage, secure, and share AI compute clusters

With the HPE Machine Learning Development Environment, ML practitioners can:

- **Train models faster** using state-of-the-art distributed training, without changing their model code
- **Automatically find high-quality models** with advanced hyperparameter tuning from the creators of state-of-the-art tuning algorithms such as Hyperband
- **Get more from their GPUs** with smart scheduling, as well as reduce cloud GPU costs by seamlessly using spot instances
- **Track and reproduce their work** with experiment tracking that works out of the box, covering code versions, metrics, checkpoints, and hyperparameters

Using a comprehensive array of features integrated into an easy-to-use, high-performance ML environment, ML engineers can focus on building better models, instead of managing IT infrastructure.

Using the HPE Machine Learning Development Environment that supports both cloud and on-premises deployment infrastructure, practitioners can develop models using PyTorch, TensorFlow™, or Keras. HPE Machine Learning Development Environment also integrates seamlessly with today's most popular ML tools for data preparation and model deployment.



With AI at the forefront of Recursion’s vision for biopharmaceuticals, we use HPE Machine Learning Development Environment to manage hundreds of on-premises GPUs, as well as dynamically scale to using GPUs in the cloud. Using HPE Machine Learning Development Environment’s native support for distributed training, we were able to reduce the training time for a key computer vision model from 3 days to 3 hours, without changing our model code.”

– Ben Mabey, CTO, Recursion

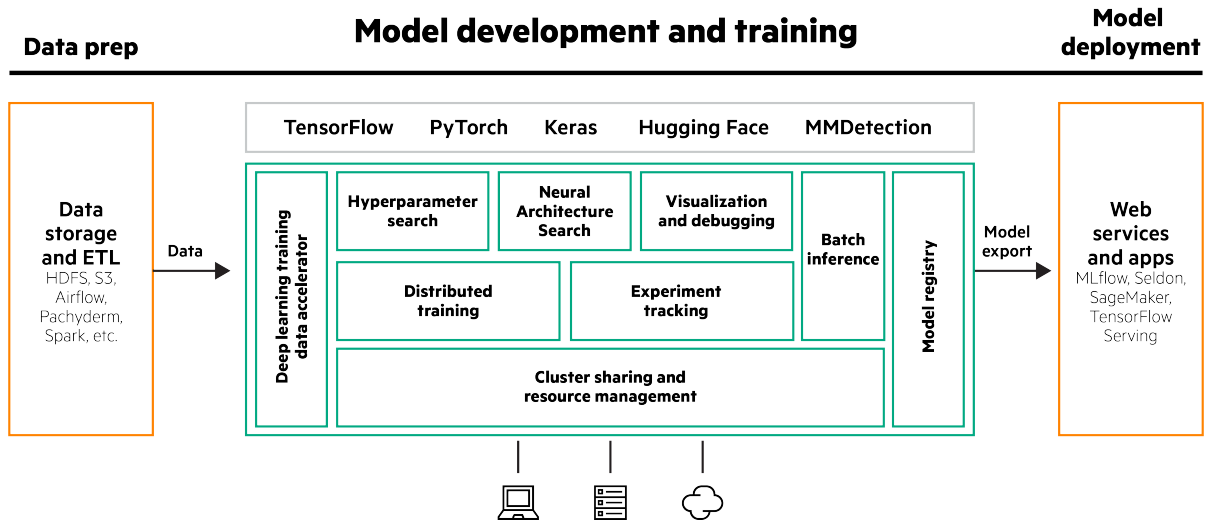


Figure 1. A block diagram describing the flow of building AI models, from data preparation, through model construction, to final deployment.

## Advanced features drive greater value

### Seamlessly scale distributed training, available right out of the box

With HPE Machine Learning Development Environment, ML engineers can seamlessly scale ML training to multiple nodes and hundreds of GPUs—without changing any of the model code. Starting a distributed training job is as simple as changing a single configuration setting.

To help ML engineers scale the HPE Machine Learning Development Environment, infrastructure code for scaling training is provided by experts and includes support for provisioning machines, networking, data loading, fault tolerance, and much more.



Figure 2. A screenshot showing how training scaling is supported with provisioning machines, networking, data loading, and fault tolerance.

## Build better models with state-of-the-art hyperparameter tuning

As an integral part of the ML development process, hyperparameter tuning plays a key role in maximizing a model's predictive performance. Applying hyperparameter tuning in practice requires important infrastructure capabilities, including distributed training and cluster management.

The HPE Machine Learning Development Environment supports state-of-the-art tuning algorithms, as well as hyperparameter infrastructure capabilities, so you can develop more accurate models in less time using fewer resources.

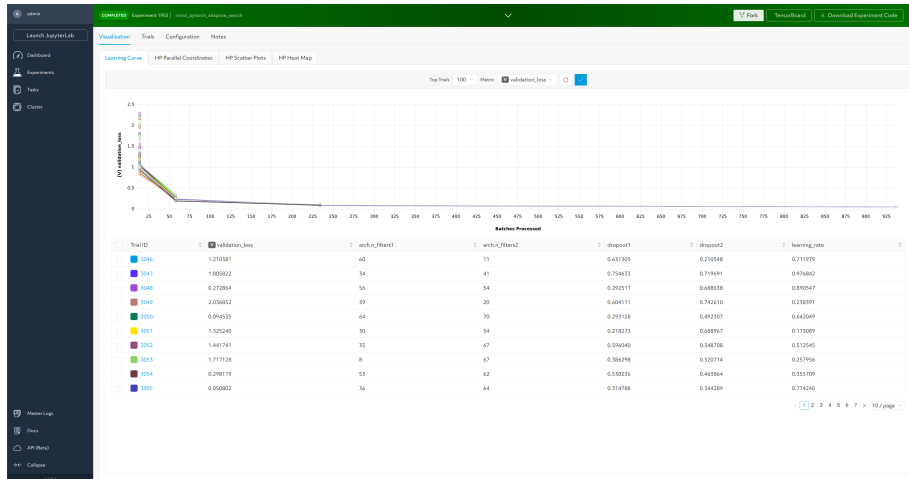


Figure 3. A screenshot showing how hyperparameter tuning helps maximize a model's predictive performance.

## Analyze your results with automatic experiment tracking

To help ML engineers analyze and reproduce results, the HPE Machine Learning Development Environment uses advanced visualization techniques together with experiment management capabilities.

Using the HPE Machine Learning Development Environment, model code, library dependencies, hyperparameters, and configuration settings are automatically persisted, enabling ML engineers to easily reproduce an experiment conducted earlier. The built-in model registry can track trained models and identify model versions that are promising or significant. As the ML team scales, these tools become critically important, as they enable collaborators to easily share and scale work as quickly as possible.

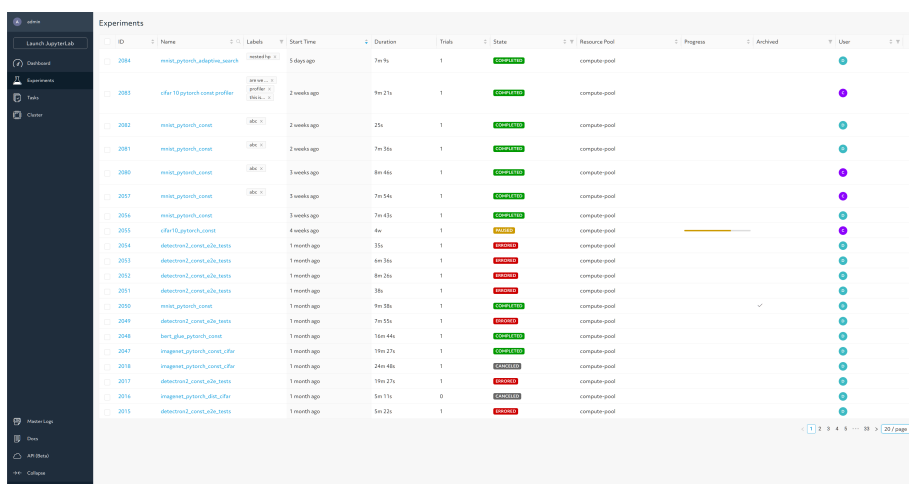


Figure 4. A screenshot showing how engineers can use advanced visualization techniques to analyze and reproduce results.

## Share cluster resources with built-in resource management

Offering built-in resource management, HPE Machine Learning Development Environment makes it easy to operate an on-premises or cloud cluster and improve a cluster's utilization. The built-in cluster scheduler allows team members to submit jobs using Kubernetes or HPE's built-in fair share or priority scheduler.

Unlike classical cluster schedulers such as Slurm, HPE also offers first-class support for ML workloads that provides:

- Scheduling for hyperparameter tuning
- Pause and restart of long-running jobs
- Automatic fault tolerance
- Seamless utilization of spot instances

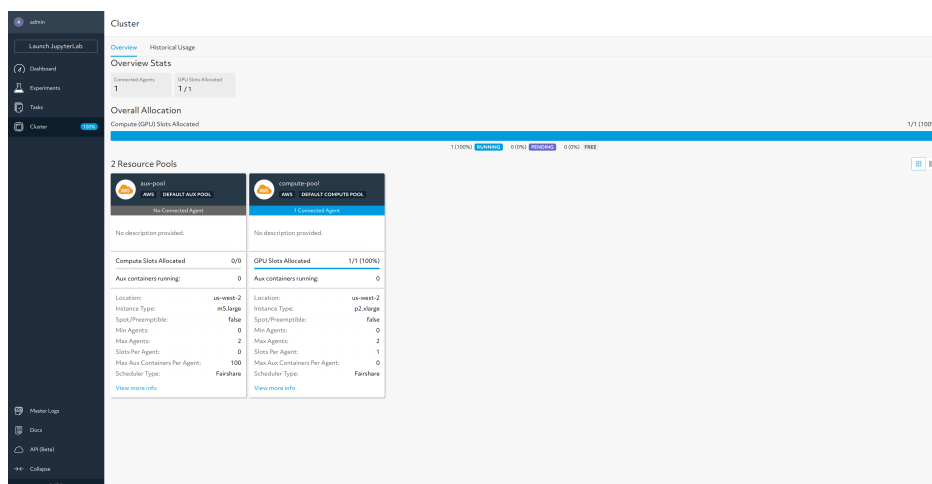


Figure 5. A screenshot showing how the built-in cluster scheduler allows team members to submit jobs using Kubernetes or HPE's priority scheduler.

## Your AI data scientists' search is over

Your organization is looking for greater opportunities for growth—and HPE Machine Learning Development Environment can help you find them. With this future-focused platform, you can successfully operate in the exascale era of high-performance computing (HPC) designed to broaden your AI and ML scale—while also combining your IT resources—to remove the complexity and cost associated with ML model development.



As an HPE Platinum Partner, Möbius Partners can help guide you in the right direction based on your unique environment. Questions?

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