

IBM PowerAI

Deep Learning Frameworks

Data, in all forms, is expanding as a resource to be utilized. Yet in many industries and professions, the data explosion is outstripping the human capacity to understand the hidden insights. AI can unlock the potential in data—internal, external, structured, unstructured, voice and visual—and make it work together. Enterprises can make better operational decisions, understand customer wants and needs, communicate in real time and optimize business processes—infused with the cognitive ability to understand, reason and learn.

Highlights

- Includes popular open source deep learning frameworks
 - Provides tools for ease of development and increased productivity
 - Speeds up training times for Data Scientists
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PowerAI helps accelerate the journey to AI by bringing together a collection of the most popular open source frameworks for deep learning, along with supporting software and libraries in a single installable package. Designed to simplify the acquisition, installation and system optimization required to bring up a deep learning infrastructure, and to provide the most comprehensive set of integrated development tools to build out a complete end-to-end deep learning solution, PowerAI allows users to spend less time on data preparation, implementation and integration, and more time training neural networks for results.

Customers of PowerAI may choose to purchase optional technical support for the entire platform.

What's new in PowerAI 1.5.4

Version 1.5.4 of PowerAI builds upon the strength of prior releases.

In this release:

- IBM enables PowerAI as a container on Ubuntu 18.04 allowing customers a new choice in operating systems.
- IBM continues Snap.ML enhancement and introduces compatibility with Spark, helping users work with and process larger data sets quickly.
- IBM continues currency of the most popular frameworks.



PowerAI Logo

Distributed Deep Learning

To accelerate the time dedicated training a model, the PowerAI stack uses technologies to deliver exceptional training performance by distributing a single training job across a cluster of servers. PowerAI's Distributed Deep Learning (DDL) brings intelligence about the structure and the layout of the underlying cluster (topology) which includes intelligence about the location of the cluster's different compute resources such as Graphical Process Units (GPUs) and CPUs. PowerAI is unique in that this capability is incorporated in to the Deep Learning frameworks as an integrated binary, reducing complexity for clients as they bring in high-performance cluster capability. Because of this capability, PowerAI with DDL can scale jobs across large numbers of cluster resources with very little loss to communication overhead. DDL is available with PowerAI 1.5.4 and is compatible with bundled TensorFlow, IBM Caffe and Pytorch frameworks.

Large Model Support

One of the challenges customers face in this space is that they are limited by the size of memory available within GPUs. As models grow in complexity and data sets increase in size, data scientists are forced to make tradeoffs to stay within the 16 or 32 GB memory limits each GPU.

With Large Model Support (LMS), enabled by PowerAI's unique NVIDIA® NVLink™ connection between CPU (memory) and GPU, the entire model and data set can be loaded into system memory and cached down to the GPU for action. Users can increase model sizes, data elements and batch or set sizes significantly, with the outcomes of executing far larger models and expanding up to nearly one terabyte (TB) of system memory across 4 GPUs. This capability is unique to PowerAI and opens the opportunity to address larger challenges and get much more work done within a PowerAI single server, increasing organizational efficiency. With PowerAI 1.5.4, LMS is compatible with TensorFlow and IBM Caffe, and is in Tech Preview with bundled Pytorch framework.

PowerAI version 1.5.4 includes the following deep learning frameworks in one installation:

- BVLC Caffe
- IBM Caffe
- TensorFlow
- TensorFlow-Keras
- PyTorch

Hardware platform description and ordering information

PowerAI is optimized for use with the following hardware configurations:

IBM Power Systems AC922 server (Model 8335-GTG) with NVIDIA Tesla V100 GPUs

IBM Power Systems S822LC for High Performance Computing (Model 8335-GTB) with NVIDIA Tesla P100 GPUs

<https://www.ibm.com/us-en/marketplace/power-systems-ac922>

Please contact IBM for help configuring or placing an order.

PowerAI is distributed as a binary for Red Hat Enterprise Linux 7.5. PowerAI 1.5.4 is orderable through eConfig.

PowerAI is also available as a container, downloadable from Docker Hub

Release Guide

A complete Release Guide with package lists, prerequisites, deployment guide and developer information is available at

<https://developer.ibm.com/linuxonpower/deep-learning-powerai/releases/>

Why IBM?

For over a century, IBM has pioneered technologies and provided services that help companies manage and mine their valuable business data. And for 25 consecutive years, IBM has topped the annual list of US patent recipients—receiving a record-breaking 9,043 patents in 2017. In addition, IBM Power Systems are trusted by 78 percent of the Fortune 100. Further, every one of the top 10 banking firms have Power Systems, as do 80 percent of the top insurance and retail companies.

For more information

To learn more about the PowerAI, please contact your IBM representative or IBM Business Partner, or visit the following website: <https://ibm.biz/powerai>

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