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Experience of Google's latest Deep Learning library, TensorFlow, with Docker in a WLCG cluster

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The researchers at the Google Brain team released their second generation Deep Learning library, TensorFlow, as an open-source package under the Apache 2.0 license in November, 2015. Google has already deployed the first generation library using DistBelief in various systems such as Google Search, advertising systems, speech recognition systems, Google Images, Google Maps, Street View, Google Translate and many other recent products. In addition, many researchers in high energy physics have recently started to understand and use Deep Learning algorithms in their own research and analysis. We conceive a first use-case scenario of the TensorFlow library to create the Deep Learning models from high-dimensional inputs like physics analysis data and such environments in a large-scale WLCG computing cluster. TensorFlow carries out computations using a dataflow model and graph structure onto a wide variety of different hardware platforms and systems, such as many CPU architectures, GPUs and smartphone platforms. Having a single library that can distribute the computations to create a model to the various platforms and systems would significantly simplify the use of Deep Learning algorithms in high energy physics. Docker presents a solution in which we can merge the application libraries and the Linux kernel into a production-level WLCG computing cluster. We therefore employ the Docker container environments for TensorFlow and present the first use in our grid system.

Tertiary Keyword (Optional)

Algorithms

Primary Keyword (Mandatory)

Experience/plans from outside experimental HEP/NP

Secondary Keyword (Optional)

Analysis tools and techniques

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