A MANAGEMENT FRAMEWORK FOR CONSOLIDATED BIG DATA AND HPC

About BigHPC

Simplifying the management of HPC infrastructures supporting Big Data and parallel computing applications.

The project will have a direct impact on science, industry and society, by accelerating scientific breakthroughs in different fields and increasing the competitiveness of companies through better data analysis and improved decision-support processes.

The BigHPC project aims at improving the management of HPC data centers and supported Big Data applications, with the following novel features:

Monitoring

Virtualization

Software-Defined Storage

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BIG HPC

THE SUPERCOMPUTERS WORKING ON BIGHPC

Texas Advanced Computing Center

About TACC

The Texas Advanced Computing Center (TACC), part of the University of Texas at Austin (U.S.A.), is an advanced computing research center that provides comprehensive advanced computing resources and support services to researchers in Texas and across the USA.
TACC designs and operates some of the world's most powerful computing resources.

Role in BigHPC

TACC is applying container technologies to the performant integration of traditional HPC and Big Data and Machine Learning workloads. Recent outcomes of this effort are the characterization of these technologies' overheads and the development of best practices to optimize their performance.

TACC is also designing the Orchestration component that intelligently schedules containerized workloads in order to minimize interference across shared resources such as networking and storage.

Infrastructure

The TACC data center has a wide variety of supercomputers with different hardware and software stacks that make it well suited to exercising BigHPC's capabilities. The breadth of available testing platforms ensures BigHPC will be maximally flexible and robust, and promote its compatibility with many supercomputing sites.

STAMPEDE2
6000 node Intel Xeon Xeon Phi system
Omnipath

FRONTERA
8000 node Intel Xeon system
HDR Infiniband

LONGHORN
104 node IBM Power9 based system
4 Nvidia V100 GPUs per node
EDR Infiniband

Minho Advanced Computing Center

MACC Minho Advanced Computing Center

About MACC

The Minho Advanced Computing Center (MACC), part of REN´s data center, in Riba de Ave, Minho (Portugal), is a national collaborative infrastructure to promote and support Open Science initiatives on supercomputing, data science and visualization.

Role in BigHPC

MACC is providing real use-cases along with the necessary computational and storage resources to validate the scientific and technical contributions of the BigHPC project. MACC will also be used to deploy and validate the project's pilot.

Infrastructure

MACC is composed of the Bob supercomputer. Bob can perform a thousand billion calculation per second. Each Bob node provides two Intel 8-core "Sandy Bridge" generation Xeon processors with 32GB of RAM, a shared storage with 338TB and High-Speed Infiniband interconnect.

BOB
600 node Intel Xeon E5-2680
FDR Infiniband
4 Nvidia Tesla T4