

PSSC Labs works with Atmospheric Data Solutions to Create Powerful Weather Modeling Solutions to Benefit Public Safety and Research Studies

ORGANIZATIONAL PROFILE

Atmospheric Data Solutions, LLC (ADS) works with public and private agencies to develop atmospheric science products that help mitigate and manage risk from severe weather and future climate change. ADS works with clients to create customized weather modeling solutions which require the design, implementation and support of high performance computers. The weather modeling solutions that ADS creates include high impact weather forecast guidance products, tailored regional wildfire forecast guidance products, and utility load and outage forecasts all require analysis of a large quantity of data that demands high performance computing to maximize accuracy and maximize the number of times models can be run daily. The work ADS produces in partnership with utility companies and other public agencies benefit public welfare and safety.

CHALLENGE

ADS was looking for efficient, powerful computing solutions for their weather modeling products. The agencies and companies ADS works with are often constrained within a limited budget for each project. The nature of weather modeling means that the faster the HPC cluster processes data, the more models can be run each day, leading to more accurate and useful information. Therefore, ADS needed to find HPC solutions that provided the most computing power within each budget range. In addition, custom software must be installed before the weather modeling solution can be delivered to clients, which necessitated ADS personnel work on site with the HPC provider to ensure that the solutions were ready to use upon delivery to client. In addition, because the engineers and scientists working with the models may not have additional expertise in implementing and supporting the cluster when delivered, ADS required a turnkey solution for its clients that was ready to use upon delivery.

SOLUTION

Scott Capps started working with PSSC Labs in 2011 while seeking a high performance computing cluster quote for SDG&E. PSSC Labs stood out among their competitors for many reasons. Most importantly, they took the time to really understand the computing needs and provided solutions which met those needs while not trying to up-sell into excessive hardware. Capps says, "When designing a system that will run weather models, it is easy to equip it with hardware with capabilities beyond what is actually needed." Capps continues, "As a result, customers pay much more for a system and only utilize a fraction of its full potential." In contrast, PSSC Labs worked with Capps to customize the HPC while staying within the budget of his client.

In one of the most recent collaborations with ADS, PSSC Labs was able to deliver a custom PowerWulf ZXR1+ Cluster for an ADS client to run weather models. The cluster included 560 Total Intel Xeon E5-2600v4 Process Cores, 1120 Cores with Hyperthreading Enabled as well as 2112 GB High Performance DDR ECC Registered System Memory, 3.7 GB per Processor Core. The cluster included 94 TB Raw Storage Capacity and Mellanox InfiniBand Connect X-4 100 Gbps High Performance Network Backplane with remote management network. The cluster ran on Red Hat Linux OS with PSSC Labs CBeST v 4.0 Cluster Management Toolkit and Rack & Roll Integration for Turn-Key Deployment, making it easily deployable upon delivery. Best of all, ADS Principal Scott Capps was able to work with PSSC Labs at their facilities to ensure that all custom software and toolkits unique to the specific weather modeling solution was pre-installed and optimized before the cluster was delivered.

IMPACT

Integrating the PowerWulf Cluster required very little effort from ADS's clients. Each PowerWulf Cluster includes CBeST, the Complete Beowulf Software Toolkit developed and supported by PSSC Labs, which included all the utilizes needed to connect the cluster and make it operational. Very little input is required from the user and PSSC Labs technicians are always available to assist with support centers entirely based in the USA. With PSSC Labs' custom solution, ADS's clients found they could run their models four times a day, as opposed twice a day with previous HPC set ups, with the results from the models delivered faster as well. "PSSC Labs was accommodating every step of the way, whether it was finding the best hardware configuration within client's budget or allowing our own engineers on site to work on the clusters before delivery," said Capps. "They really work with us to ensure delivery of the highest performance weather modeling solutions possible."