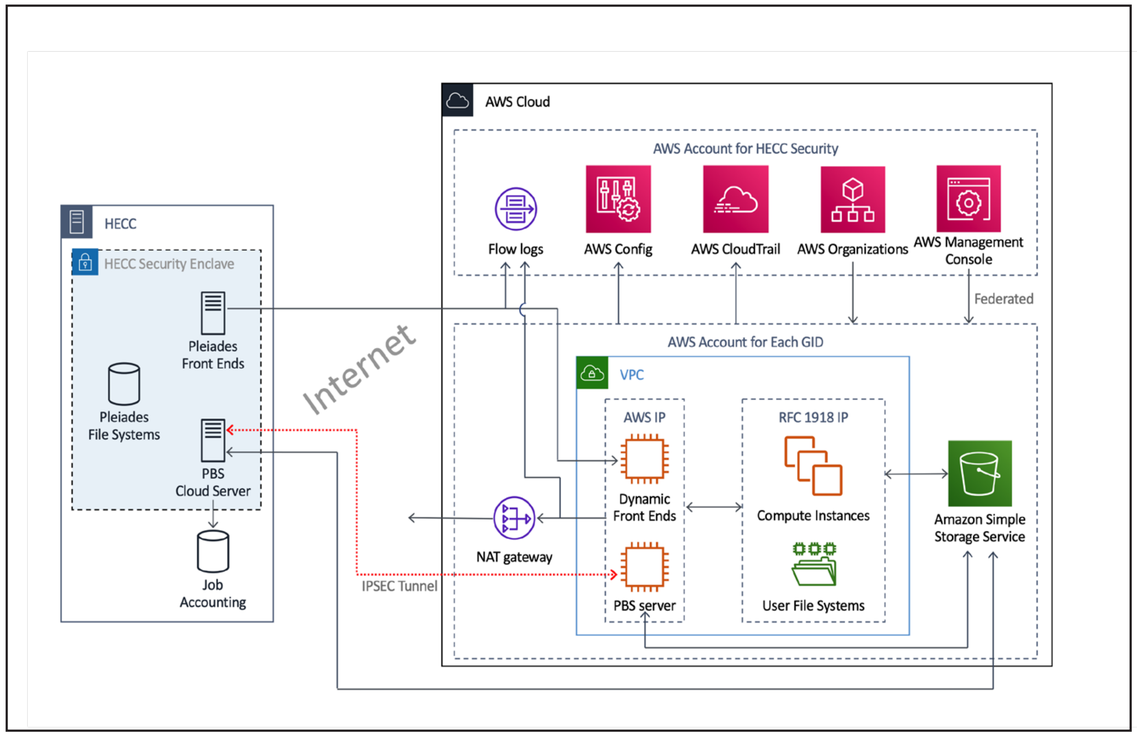
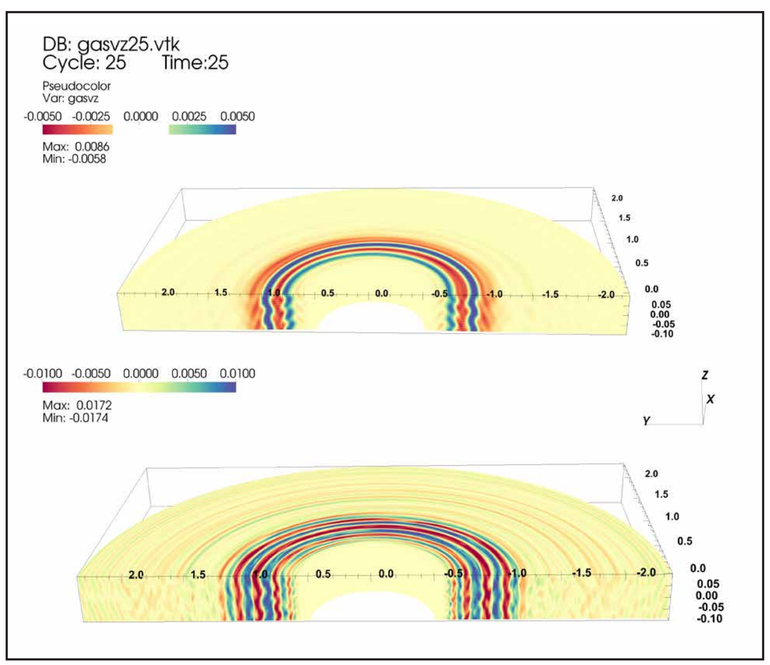


Two considerations are driving the process of integrating AWS resources into the HECC environment: convenience for users and security for NASA. Users can run AWS jobs either through cloudbursting via the HECC Portable Batch System (PBS) server or by logging directly into an AWS front end. Files can be staged between HECC systems and AWS or stored at AWS. Security is achieved by keeping all AWS and system logs in a separate AWS account, which also acts as a gateway for HECC staff to access the AWS console when needed. *Steve Heistand, Sherry Chang, NASA/Ames*



In this image from a simulation run on AWS using a HECC cloudbursting mechanism, a planet embedded within a gaseous disk around a young star excites spiral waves, which can break into turbulence due to hydrodynamic instability. The use of GPU-accelerated nodes at AWS enabled an increase in resolution from 512-by-128-by-128 (top) to 2048-by-512-by-512 (bottom). While the spiral wave instability (SWI) develops with both, the SWI-induced turbulence is better resolved with a larger number of grid cells. *Jaehan Bae, Carnegie Institution of Washington*

National Aeronautics and Space Administration

Jumping the Queue: From NASA to the Commercial Cloud

NASA's High-End Computing Capability (HECC) Project has made it possible for its users to run on commercial cloud resources in a seamless way. In the first of three phases, we implemented a pilot project for a few users, enabling them to "jump the queue" and burst jobs from the HECC environment to Amazon Web Services (AWS). By using GPU-accelerated nodes at AWS, the users were able to make significant advances in their research. The second phase of the project made AWS access available to all HECC users and added accounting to make users responsible for cloud charges. We are also enabling export-controlled work through the use of AWS GovCloud. In the third phase, we will add web-based mechanisms to permit non-HECC users to access cloud resources for their HPC projects.

Robert Hood, Steve Heistand, NASA Ames Research Center

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