

Securelinx Hybrid Cloud for HPC

Solution Technical Overview

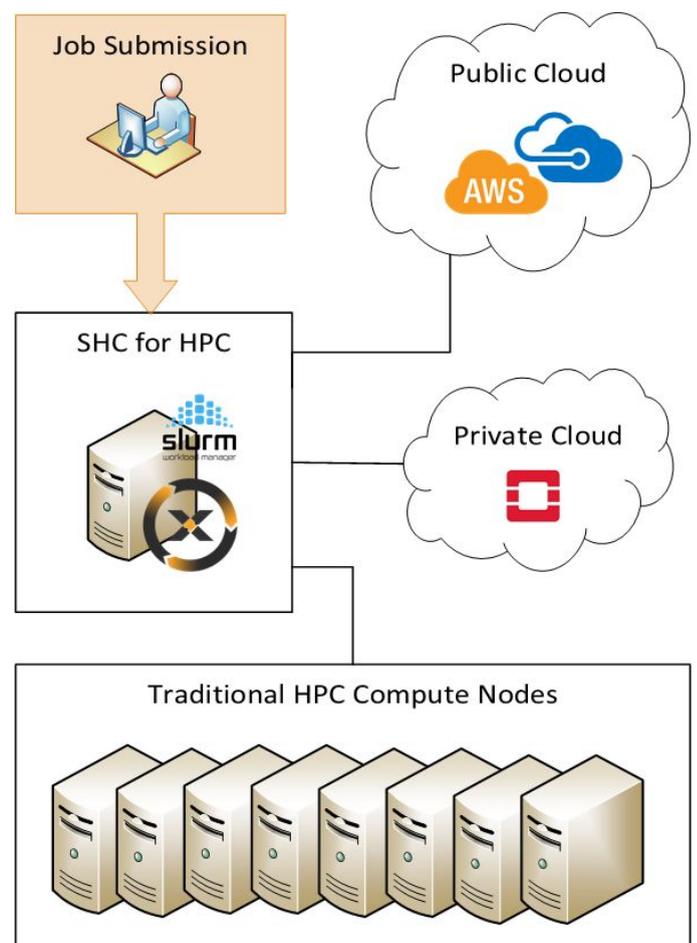


As a leading Linux enterprise solution and skills provider Securelinx has been active in the HPC sector for many years. More and more customers are seeking ways to leverage HPC as a Service and Public Clouds for certain HPC workloads. As a result Securelinx has developed a customised approach to connect on-Premise HPC environments to Cloud environments

Securelinx's Hybrid Cloud solution for High Performance Compute (HPC) builds on the established capabilities of Slurm, an open source, fault-tolerant, and highly scalable cluster management & job scheduling system used successfully on many Linux HPC clusters, both large and small. Slurm's Elastic Compute capability Securelinx Hybrid Cloud for HPC (SHC) integrates with Slurm and uses cloud native APIs to create an elastic, hybrid, high performance compute cloud.

As a cluster workload manager, Slurm has three key functions. First, it allocates access to resources (compute nodes) so users can perform work. Second, it provides a framework for starting, executing and monitoring work (normally a parallel job) on the set of allocated nodes. Finally, it arbitrates contention for resources by managing a queue of pending work. Systems connected to Slurm can be standard physical compute nodes, or cloud instances running in either the private or public cloud.

Via (SHC) the scheduler can be configured to communicate with traditional on premise infrastructure, private cloud and public cloud. The SHC solution consists of a number of custom scripts which augment slurm power saving features with on-demand burst capabilities. This logic is well suited to the needs of an elastic HPC cloud, where significant cost savings can be realised by providing the relatively heavy compute resources only as they are required.





“The SLURM interface is a familiar one in the HPC community. With the additional elastic hybrid compute handled transparently by SLURM + SHC we bring the benefits and flexibility of hybrid cloud to the end users without the need for them to learn additional tooling.”

Dr. Sean Brisbane, HPC Specialist at Securelinx

SHC also controls boot and configuration options to the compute nodes to allow them to learn about their environment and take advantage of differentiating features of the cloud they are in, for example an OpenStack cloud may have a large pool of cost effective software defined storage attached that should be made available to the node. The execution queue in SLURM gives users a degree of control over what nodes and features their jobs require, which is then married to cloud, SKU and configuration parameter selection within SHC.

Currently the solution supports virtual and bare metal nodes on an OpenStack private cloud and the Microsoft Azure Public Cloud. Support for Amazon Web Services (AWS) Cloud and Google Cloud Platform (GCP) is expected in a future release. The solution approach is flexible enough to support any environment, which could be added once the appropriate APIs are available.

SHC can be deployed during a green field installation or it can be integrated into existing HPC environments. The SHC components are typically deployed alongside the Slurm Master on the head or control node of the cluster. As these components do not have any significant resource requirements they can run on premises or in the public cloud.

To run compute jobs easily in any environment connected to the SLURM solution the key is to make storage access as homogeneous as possible across the environments. Securelinx can advise on this on a case by case basis.

Securelinx is an award-winning Enterprise Linux and Open Source Solutions supplier providing Linux Infrastructure, subscriptions, services, support and training solutions to customers throughout Ireland and the UK. Our team has the highest technical accreditations available along with in-depth project experience gained over many years.

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