

HPC in the Cloud: Gompute Support for LS-DYNA[®] Simulations

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Abstract

During the last decades, companies have been introducing CAE simulations as part of their product development with the main objective of improving reliability and reducing the costs of prototyping. It is nowadays demonstrated that introducing simulations during an early step of the product design process reduces the risk of failure as well as the associated costs, when the prototypes need to be redesigned.

Traditionally, enterprises have invested in geographical independent local workstations or clusters that nowadays resulted in non-connected computational units. Besides, CAE Software used for analyzing problems like crash tests or impacts resulted in an essential tool for any Engineer, forcing the growth and development of faster and more powerful computing stations. In order to make the hardware investment more efficient, enterprises are considering new solutions like consolidation of internal resources with Private Enterprise Cloud Environments or External HPC Cloud Services. New challenges arise with this technology such large data transfers and 3D remote visualization over medium to high latency links.

Gompute has been developing HPC solutions since 2002 to cover these needs both for enterprises and small consultants, offering a complete portfolio that allows user to fulfill all his needs from a unique HPC partner.

1. Gompute Solutions

Gompute provides solutions for HPC users running internally, in the cloud or both. Figure 1 shows a view of the different packages available for enterprises using heterogeneous types of hardware like Visualization Nodes for pre or post-processing, GPUs or CPUs and users that want to run on a cloud service and just get the specific hardware required by a project or demanded for daily use with the possibility to expand it when there are peaks of workload.

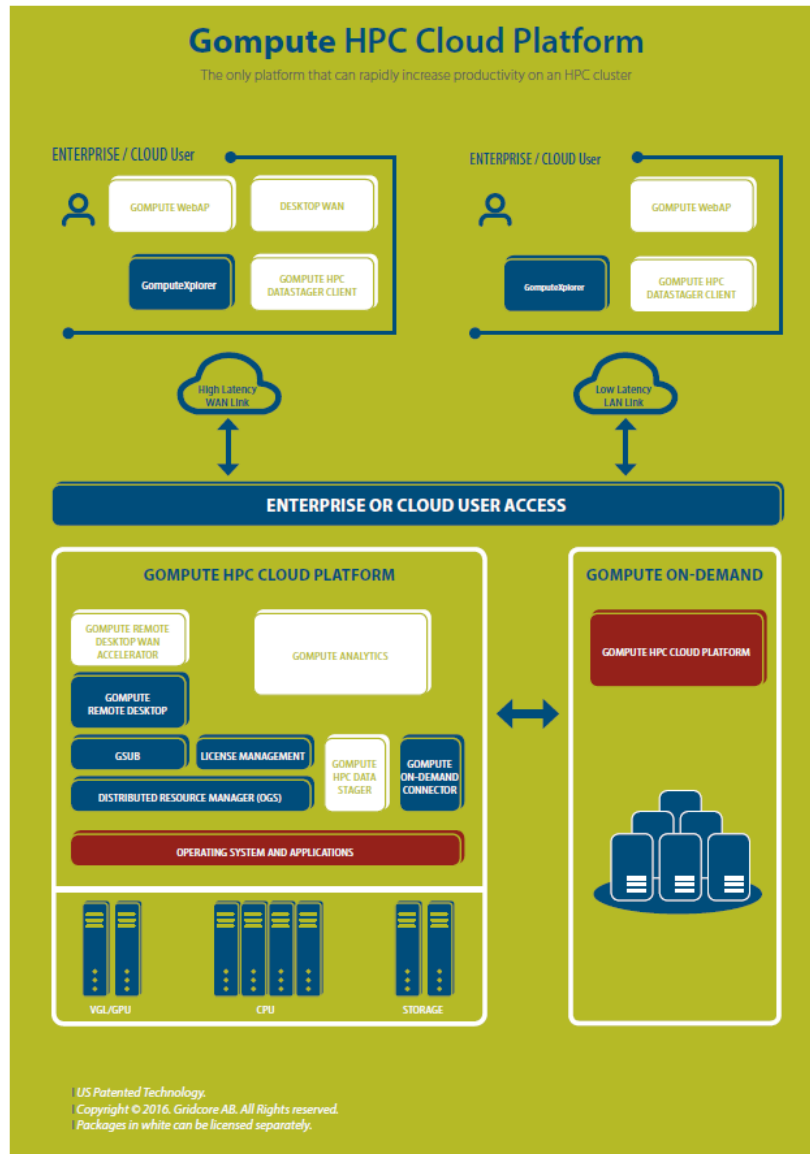


Fig. 1 : Gompute solutions overview

Running LS-DYNA Simulations in the cloud: Gompute On-Demand

Gompute on Demand delivers HPC as a service. It provides customers with a turnkey environment backed by specialized support to solve computationally intensive workloads.

As a HPC Service for CAE workloads different versions of LS-DYNA are available as well as other applications, allowing users to get a complete ready-to-use solution with flexible amount of resources to be adapted to the immediate needs.

LS-DYNA is a finite element program for solving complex problems, and these problems require different hardware fitted to the workflow needs. Gompute’s solves this letting the user to book in advance the amount of

cores needed and select special hardware if required like nodes with large amount of memory for FEM or graphic nodes for pre and post processing purposes.

One company can have one or several users, and share desktops in order to avoid data transfer out of the cluster. As the software is pre-installed, Gcompute On Demand reduces the provisioning time compared to buying internal capacity and allowing the users to start a project in a short time frame.

Purchasing computing power

Compute on Demand offers subscription to a private cluster with an HPC environment compatible with the chosen security policy. Users and departments can be organized as needed and seamlessly combined with the application environment tailored to the customer's needs.

Computing resources are added to this private cluster as reserved nodes and extra storage. Nodes are Infiniband interconnected for a correct scalability.

Remote Visualization & Collaboration

Compute on Demand is powered by Gcompute's cutting edge technology for remote visualization, letting users access their applications with its original GUI.

Compute on Demand's remote visualization improves productivity by providing effective collaboration between geographically distributed teams in different continents. Team members or third party support can share desktops helping in quick decision making and cutting costs.

Supported Applications

Compute supports both commercial and open source software. Users have the possibility to run both batch jobs and launch their favorite application using its native Graphical User Interface. A large number of commercial and open-source applications are pre-installed and ready to go.

Compute's solution architects can help you integrate any application, including custom applications.

LSTC portfolio is available in Gcompute On Demand, allowing the user to perform workflows in a single environment, with option to install exclusive or own-developed applications.

Dyna licenses

Compute, as a ready to use solution, offers several options to handle Dyna licensing:

- Host licenses on the Gcompute On Demand cluster.
- Fetch the licenses from their own license server
- Flexible usage of Dyna licenses based on hourly use

In any case, LSTC rules are applied and might vary depending on the region.

Compute on Demand facilities

All computing resources are hosted in Gompute's own data center located in Sweden.

This center is designed primarily for high security and large power density with redundant internet connections, fire safety, as well as state of the art cooling and power system.



Fig.2: Gompute Data Center, Gothenburg (Sweden)

Compute Support

Compute On Demand provides personalized support for the users, letting them focus on their cases while they get a ready-to-use platform developed and maintained by experts in HPC and CAE. Support can also be provided for special development of codes and installation of user developed applications.

Security of the solution

Compute on Demand is provided in the form of a private Linux cluster with a private internal network and file system.

The service is capable of complying with most security requirements in terms of user identification, data security and system access by using various techniques, e.g. data encryption, VPN based communication etc.

Compute owns and operates its own infrastructure and datacenter making it capable of delivering secure solutions to global organizations or institutions.

More Information

For more information or testing of the service, please contact info@gompute.com or visit our website www.gompute.com