

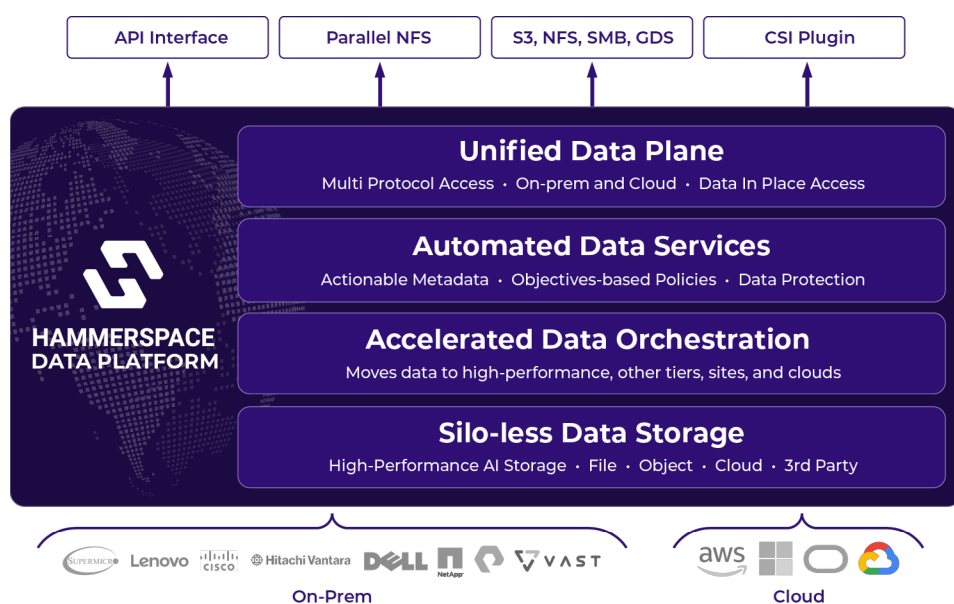
Hammerspace and Google Cloud

SOLUTION GUIDE

Unify, Orchestrate and Accelerate Your Data in the Cloud

Hammerspace helps Google Cloud Platform (GCP) customers unlock the full value of their data by breaking down silos across on-premises, cloud providers, and cloud regions. Together with GCP, we make it easy to move data where it's needed, speed up AI and HPC projects, and simplify hybrid-cloud operations. The result is faster time to value, lower infrastructure complexity, and greater consumption of GCP compute and storage resources.

Hammerspace is available on the Google Cloud Marketplace and runs on standard GCP VMs.



Solution Benefits:

- Unify Distributed, Siloed Data with a Global Namespace
- Migrate Data from On-Prem and Other Clouds to GCP
- Run Demanding AI/HPC Workloads in the Cloud
- Simplify Hybrid-Cloud Infrastructure
- Streamline Cloud Data Pipelines and Workflows
- Drive GCP Compute and Storage Consumption



Deploying Hammerspace on Google Cloud

Hammerspace software is deployed on standard GCP infrastructure. There are two components of the Hammerspace software architecture:

Metadata Servers, called Anvils, host the metadata database, act as the control plane, and provide routing information to the clients. There are two Anvil metadata servers per cluster, in other words per site, for high-availability.

Data Services nodes, or DSX nodes, are used to scale out client access across NFSv3, SMB, and S3 protocols, can act as a data store in the cloud and on-prem, and can also act as a data mover for NAS-to-NAS and NAS-to-Object data mobility. There are 2 to 60 DSX nodes per cluster depending on the performance and scale requirements.

Hammerspace can also add storage volumes from any Linux storage server and make those volumes part of the Hammerspace file system. For example, you can add high-performance storage by using Google VMs with NVMe storage.

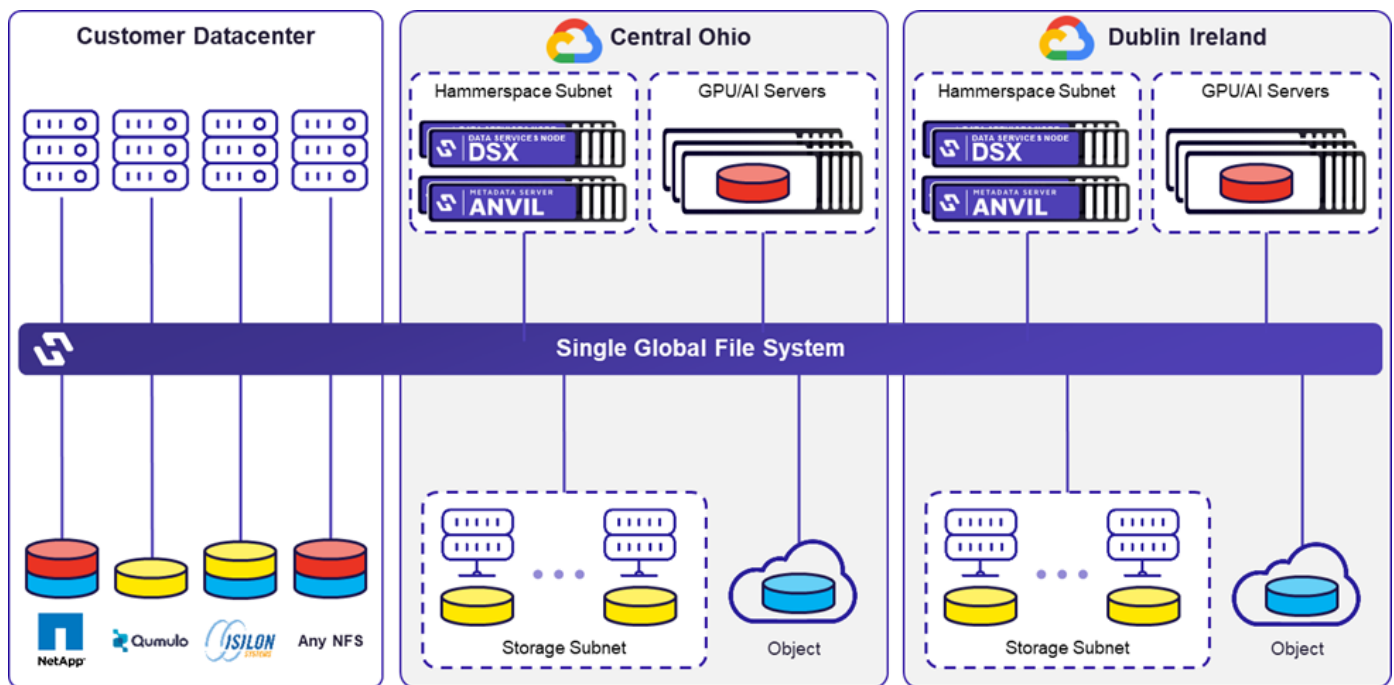
Hammerspace allows you to add the NVMe storage volumes that are local to GCP compute VMs, and aggregate these volumes together to create a tier of ultra-fast, low-latency NVMe storage that is called "Tier 0."

With Tier 0, files stored on these local NVMe volumes can be protected by mirroring data on different nodes, and data can also be tiered off to external storage - for example Google Cloud Storage (GCS) - for long term storage. No matter where the files are stored physically within the Hammerspace file system, the files and objects remain visible and accessible via NFS, SMB, and S3.



Example Hybrid-Cloud Deployment

An example hybrid-cloud deployment is shown in the figure below, which shows one customer data center and two GCP cloud regions connected with a Hammerspace global file system.



In this example, the Hammerspace metadata servers are deployed on (2) GCP VMs, and the DSX nodes are also deployed on (2) GCP VMs. Each of the GCP cloud regions have GPU VMs that are connected to the Hammerspace Data Platform.

The local drives in these VMs are used as a Tier 0 layer for the applications running on those VM's. A Tier 1 storage layer is also being used. These are Linux VM's with internal NVMe drives in them. And finally, Google Cloud Storage (GCS) is used as a tiering bucket as well as the shared object store used to transport data between sites.

