Zadara for Enterprise Storage Workloads at Google Cloud Platform

zadara

Executive Summary

Zadara® brings to the Google Cloud Platform (GCP) enterprise data storage solutions that are designed to address customers who are moving enterprise workloads to the Cloud. Zadara facilitates these workloads by providing a Storage-as-a-Service (STaaS) offering — consisting of servers, networking and a software-defined storage stack — in data centers that are located nearby Google Cloud Regions.

Introduction

Using Google's low-latency Direct Peering network, GCP customers can easily connect to an enterprise-grade NAS with market-leading storage features. Google's vast network provides an onramp to migrating data to the cloud while enabling customers to access common NAS shares from remote offices and any GCP region. Moreover, Zadara's software-defined networking enables share accessibility from other public cloud providers and data center colocation facilities.

With GCP and Zadara, enterprise customers can now benefit from a solution that is either 100% cloud based, or a hybrid cloud that bridges across workloads. With the flexibility of a software-defined network, infrastructure is simplified allowing workloads to move across cloud boundaries while keeping data persistent in one location.

Enterprise Storage Features

- Block, File and Object Storage
- NFS, CIFS (with Active Directory), iSCSI, iSER
- Large Volume Sizes
- Data Encryption at-rest and inflight (customer owns the keys)
- Cluster Support
- Thin Provisioning
- Tiered Storage
- Non-disruptive Upgrades

Cloud Architecture

Zadara's architecture is software-defined storage whereby physical resources are deployed as a virtual cloud in a data center adjacent to GCP for optimal performance with accessibility using the Direct Peering network. Zadara's Cloud provides multi-tenancy with complete isolation of front-end networking, vCPUs for the virtual array controllers, and physical drives.

When a customer creates a Zadara Cloud account, they are presented with a private VLAN to connect their servers to storage resources they provision within the Zadara Cloud. Customers can deploy a virtual private storage array providing them access to block or file (SMB/NFS) storage services, or Object Storage for object based storage services. Zadara's patent for deploying virtual private storage array resources yields a single-tenant experience in a multi-tenant environment. This isolation gives customers predictable performance even though resources are available in a public cloud.
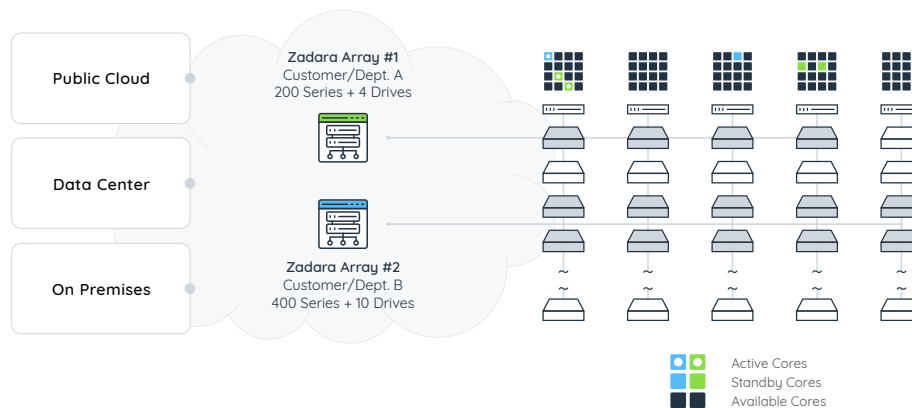
Network Architecture

Customers access the storage from GCP through the front-end Zadara VLAN that is provisioned for them. Routing from GCP to Zadara's infrastructure is via a single shared VLAN with isolated subnets for individual customer accounts. IPSec connectivity is highly recommended for this configuration. A future proposed offering of GCP layer-3 networking to external networks will enable a layer of flexibility and security where encrypted traffic requirements may be lifted.

Zadara also has the capability to route other network traffic from other pubic clouds such as AWS and Azure or private infrastructure in a co-lo or data center. This cloud hybridization gives customer an easy migration pathway into GCP using a common NFS or SMB/CIFS shares.

High Availability

All physical and virtual components are deployed in a minimum of two units for high availability storage cloud environment. Redundant front-end/back-end switches with bonded Ethernet connections ensure data accessibility given a port, cable or switch failure. Likewise, redundant servers cover the case when a server fails. Virtual private storage array resource allocation of physical and virtual assets are scheduled such that there is no single-point-of-failure.

Controller Architecture

Zadara's virtual private storage arrays consists of two virtual array controllers providing full redundancy in the event of a hardware failure. This design also gives the customer the option to scale their controller performance up or down by adding or reducing the number vCPUs and memory designated as the "Zadara IO Engine". Moreover, maintenance and/or upgrades can be applied online transparently to the application and user experience.

Drive Architecture

Customers can select a variety of media types suited to meet their performance and bandwidth requirements. The cloud supports SAS, SATA and SSD with the latter two as the predominate choice. With rotating media, a hybrid drive of SSD and SATA/SAS can be configured with up to 3.2 TB of a caching layer. The hybrid configuration can provide lower-cost high IOPS solution rather than going with an all flash solution.

Durability Architecture

Different levels of RAID protection are offered as a balance between performance, durability and storage efficiency. Customers can stripe RAID groups for increased performance. Current durability levels are:

- RAID-1 – for all media types and hybrid SSD caching
- RAID-1+1 – (3-way mirror) for all media types
- RAID-5 – for SSD and SAS media types
- RAID-6 – for all media types
- 2-Way – copies for Object Storage
- 3-Way – copies for Object Storage

Scalability

Zadara provides customers the capability to scale up, scale down and scale out their storage requirements as needed. Rigid physical constraints are removed with seamless migration of data between different media and controllers. Migration is pool based and does not require downtime or remounting of shares on host servers. Some example use cases:

- **Scale Down Storage** – Move data to smaller or slower media pool. Remove drives from media pool.
- **Scale Up Storage** – Move data to faster or larger media pool. Add drives and expand media pool.
- **Scale Down Controller** – reduce number of vCPUs (requires failover).
- **Scale Up Controller** – increase number of vCPUs (requires failover).
- **Scale Out** – Quickly provision additional virtual private storage arrays and mirror data to array.

Enterprise Feature Set

Each virtual private storage arrays includes enterprise features available for customer use.

Snapshots

- Zadara's copy-on-write uses efficient technology where physical data is not moved, but reallocated within the virtual metadata for the volume or share
- Low 1-minute RTO
- Quick zero-copy mounting of snapshots for recovery of lost data
- Clone volumes for sandbox testing of production data
- Mirroring
- Asynchronous snapshot-schedule block copy of volumes or shares to target endpoint
- Mirroring to lower cost media for higher durability or backup within virtual private storage arrays
- Mirroring to local cloud-based virtual private storage array to scale out
- Mirroring to remote virtual private storage array for disaster recovery with bi-directional re-synchronization of data

Backup to Object Storage

- Block copy of volume or share to AWS S3 or another S3/Swift target
- Zero-copy restoration to any virtual private storage arrays
- Restoration of data to public cloud block devices
- Restoration of data to VM running on desktop or laptop

Encryption

- Customer owns keys
- AES-256 encryption at-rest
- IPSec for in-flight data

Protocol Support

- iSCSI for block access
- FCP-SCSI for Fibre Channel (if available in public/private cloud)
- NFS 3 or NFS 4
- SMB/CIFS 3.0 with Windows Active Directory integration
- S3/Swift

Docker

- Run public and private Docker containers on the array
- Fast local disk access to NFS shares
- Quick administration of shares with SSH accessibility
- Run anti-virus directly on the array without scanning over network

Additional Resources

See additional documentation on the Zadara website.

Transform your business with zero-risk enterprise storage.
Zadara transforms storage-related costs from a variable mix of equipment and management expenses to a predictable, on-demand, pay-per-use, elastic service that greatly simplifies planning, streamlines budgeting, and improves return on investment (ROI). Find out how zero-risk enterprise storage can help transform your business. Call or email today.

+1 949 251 0360
sales@zadara.com
www.zadara.com

zadara