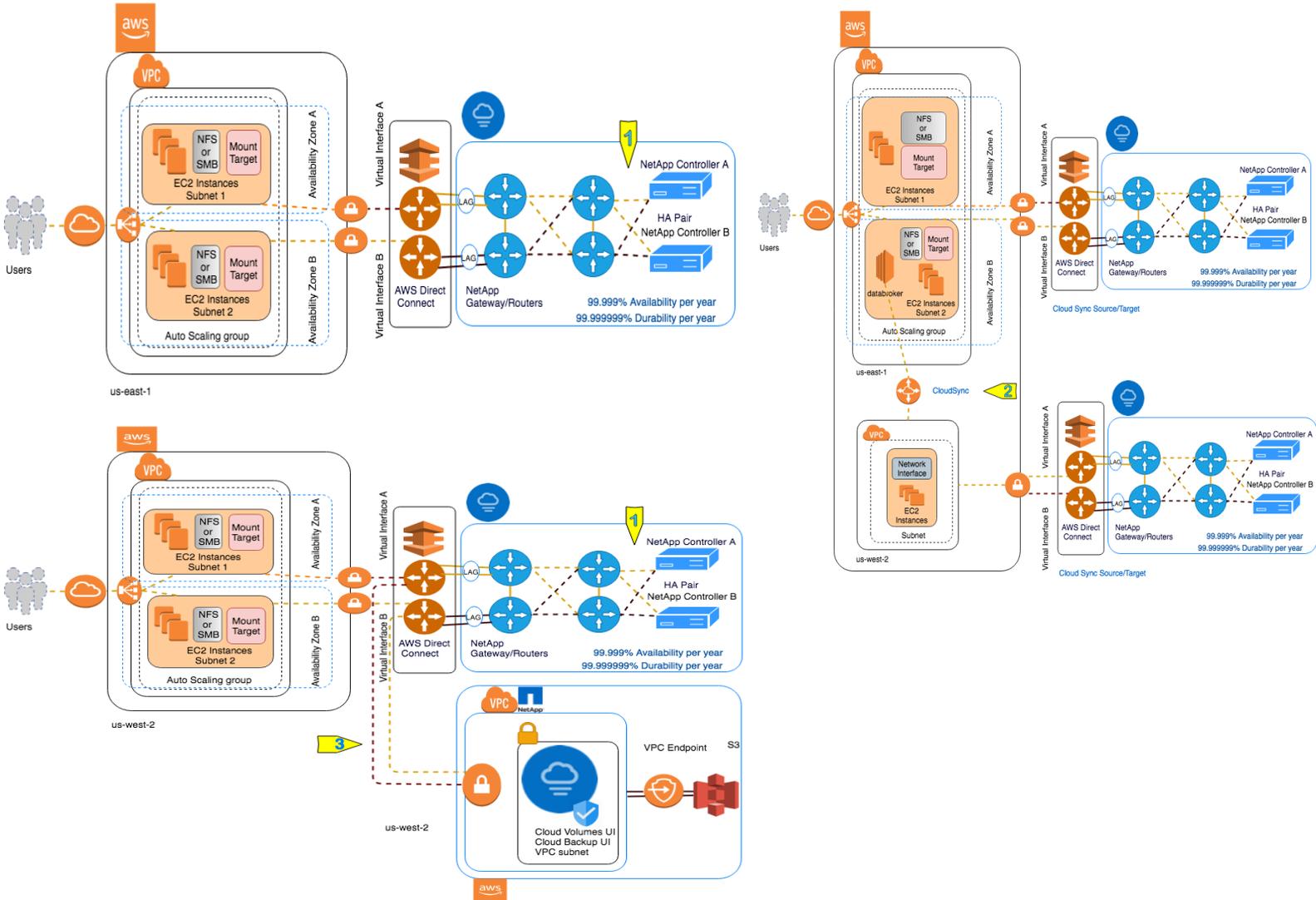


Fault Tolerance & High Availability with NetApp Cloud volumes service

NetApp cloud volumes service provides persistent storage to build reliable, fault-tolerant and highly available systems in the cloud. These qualities are designed into our cloud volumes services both by handling such aspects without any special actions by the customer. Amazon EC2 provides infrastructure building blocks that, by themselves may not be fault-tolerant. By combining with other AWS features and cloud volumes service the EC2 instances are backed by persistent storage which is reliable, fault-tolerant and highly available. The NetApp Cloud volumes is based on the NetApp ONTAP infrastructure. The Cloud volumes are presented to every AZ in the region, and therefore there is no need to make copies of the data in each AZ like other solutions.



System Overview

- 1** The NetApp cloud volumes infrastructure clusters are configured in high-availability (HA) pairs for fault tolerance and non-disruptive operations. If a node fails or if there is a need to bring a node down for routine maintenance, its partner can take over its storage and continue to serve data from it. The Partner gives back storage when the node is brought back online.
- 2** The NetApp cloud volumes infrastructure has integrated with cloud sync feature. Cloud Sync is designed to address the challenges of synchronizing data to the cloud by providing a fast, secure, and reliable way for organizations to transfer data from any NFSv3 or CIFS file share to another NFSv3 or CIFS file shares across regions. Cloud Sync works not only with NetApp storage, but with any NFSv3/CIFS share. Having your data continuously in two (or more) places gives companies a ton of options. You can use the target as a backup, as a DR location, a clone of the dataset, or the source for a swarm of clones and copies, for analytics, new app development, etc.
- 3** The NetApp cloud volumes infrastructure has an integrated cloud backup service feature. Cloud Backup Service offers add-on backup capabilities to protect Cloud Volumes Service volumes to hyperscaler object storage. Cloud Backup Service offers the below capabilities,
 - Fully managed by NetApp
 - Scheduled and manual backup of a volume, volume restore
 - Backup data stored in object storage form in hyperscaler object service
 - Integrated UI look and feel with Cloud Volumes to perform self-service operations
 - Billed on a metered basis, integrated with hyperscaler billing
 - Full API support
 - Provides End to end security and no public access
 - Data secured at-rest with AES-256bit encryption
 - Data secured in flight to object storage using TLS/HTTPS
 - NetApp controlled cloud access (encryption key, cloud credentials, cloud management access)
 - Multiple layers of encryption for tenant security and separation

