Introducing the Storage Services

These core OpenStack services provide storage resources in various formats and by multiple access methods. Cloud users deploy application VMs that consume these storage resources.

Compute Service (Nova)
The `Compute` service manages VM instances that run on hypervisor nodes. It uses storage to provide system disks, swap volumes, and other ephemeral disks for launching and running instances. This service interacts with the `Identity` service for authentication, the `Image` service to obtain images, and other storage services to access additional forms of persistent storage for running instances to use. The `Compute` service uses `libvirtd`, `qemu`, and `kvm` for the hypervisor.

Block Storage Service (Cinder)
The `Block Storage` service manages storage volumes for virtual machines, including both ephemeral and persistent block storage for instances that the `Compute` service manages. The service implements snapshots for backing up and creating new block storage volumes.

Image Service (Glance)
The `Image` service acts as a registry for images that build instance system disks when they are launched. Live instances can be saved as images for later use to build new instances.

Shared File Systems Service (Manila)
The `Shared File System` service uses the network infrastructure to implement file sharing as a service. Because cloud users normally do not have connection privileges to the file share server, this service brokers connections to configured back ends. The service uses NFS and CIFS protocols to access file share servers. Administrators can configure this service to access multiple file share servers.

Object Store Service (Swift)
The `Object Store` provides storage for users to upload and retrieve objects as files. The `Object Store` architecture is distributed across disk devices and servers for horizontal scaling and to provide redundancy. It is common practice to configure the `Image` service to use the `Object Store` service as its storage back end, to support image and snapshot replication across the `Object Store` infrastructure. This service also provides a backup solution for other services by storing backup results as retrievable objects.

Red Hat Ceph Storage (Ceph)
Red Hat Ceph Storage is a distributed data object store that is used as the back end for all the other storage services. Ceph is the most common back end that is used with OpenStack. Ceph integrates with OpenStack services such as `Compute`, `Block Storage`, `Shared File Systems`, `Image`, and `Object Store` to provide easier storage management and cloud scalability.

Introducing Services for Integrating Storage

These additional core services provide overcloud installation, service container deployment, and the authentication support that are necessary to implement storage integration.

Identity Service (Keystone)
The `Identity` service authenticates and authorizes all OpenStack services. This service creates and manages users and roles in domains and projects. This service provides a central catalog of services and their associated endpoints that are available in an OpenStack cloud. The `Identity` service acts as a single sign-on (SSO) authentication service for both users and service components.