



Keystone Service Delivery Architecture

NetApp Keystone

NetApp
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Overview

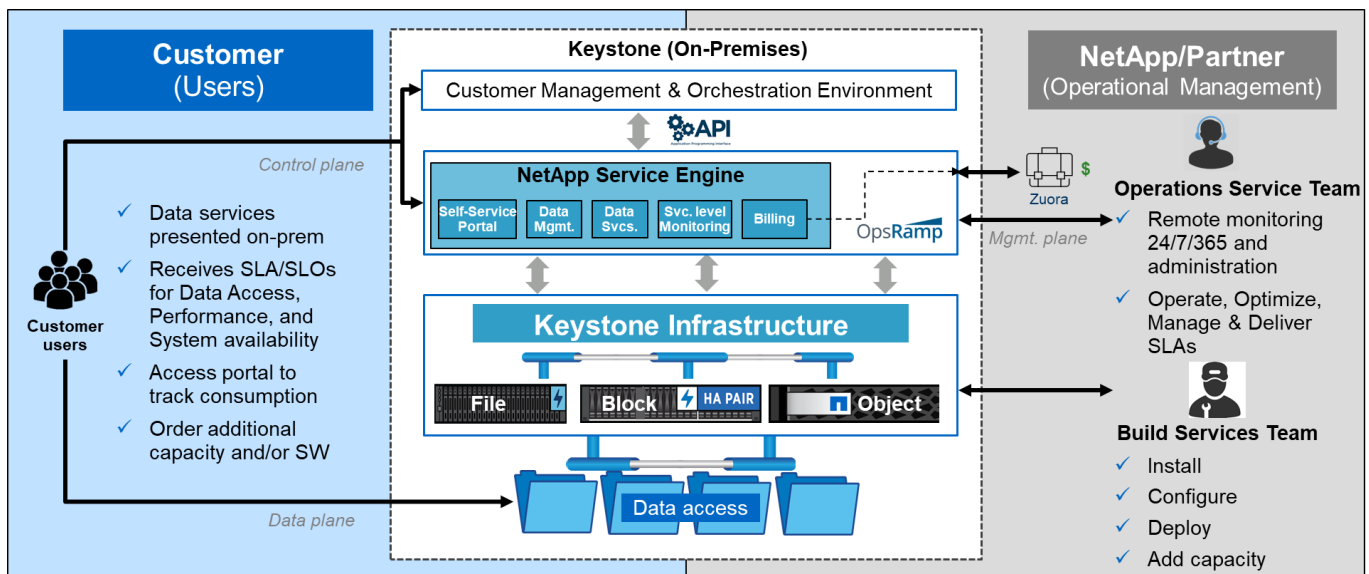
This section describes the KFS infrastructure architecture and management application for the NetApp- and customer-operated environments.

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The Keystone service delivery model includes multiple components:

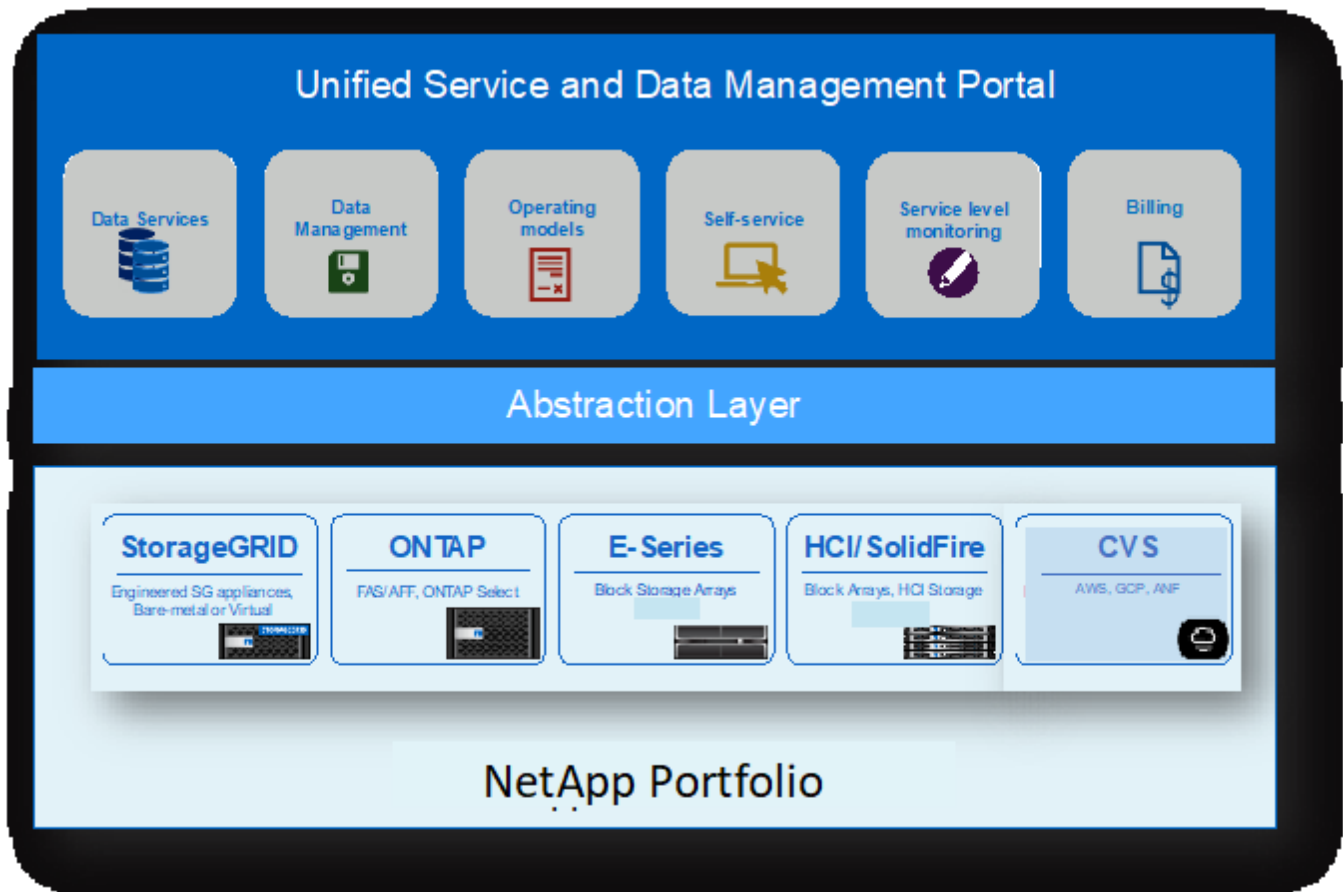
- Service interface with NetApp Service Engine.
- Keystone API's for integration.
- A Keystone service infrastructure. that includes storage controllers
- Tools to manage and operate the service such as OpsRamp, Active IQ, and AIQ Unified Manager.



NetApp Service Engine

The NetApp Service Engine web portal provides the means to manage and monitor a NetApp Keystone subscription storage service in a NetApp-, partner-, or customer-operated model. The portal consists of the following features:

- A graphical interface (NetApp Service Engine web interface) that supports monitoring and simple storage provisioning.
- A set of Keystone REST APIs that allow more advanced setup and storage management actions.



The NetApp Service Engine portal is a single interface that allows customers to perform the following tasks:

- Subscription dashboard. View status of subscribed capacity and how much is being consumed.
- Storage provisioning. Workflows to create your NFS/CIFS file shares, FC/iSCSI disks, and S3 bucket.
- Data protection. Create snapshots and set backup policy or data replication on the provisioned file share or disk.
- Reports. View file shares and disks inventory and also trend on capacity usage against different service levels.
- Manage subscription. Order additional capacity to an existing subscription or a new service through the portal.
- Submit service requests or support issues and view their status

The complete functionality of NetApp Service Engine is available only in the NetApp-operated model, in a customer- or partner-operated model, the NetApp Service Engine functionalities are limited to reporting and subscription management.

Software for Keystone Flex Subscription Service

The below table lists the software components KFS service.

Software	Description
NetApp Service Engine	NetApp Service Engine is the orchestration application that allows customers to automate provisioning, service level monitoring, and reporting.
Active IQ Unified Manager	Active IQ Unified Manager enables NetApp to monitor health and performance of ONTAP storage systems.
OpsRamp	OpsRamp enables remote monitoring, operations, management, and support of the on-premises Keystone system.

Keystone Infrastructure

This section describes the infrastructure components used in the customer- and NetApp-operated offerings. The components are also classified based on whether they reside in the data versus control plane that serve to segregate user data from command and control data.

Component	Plane	Operation Model	Purpose
Storage controllers	Data	Customer and NetApp/partner	Provides storage capacity for KFS NetApp AFF and FAS controllers are used based on capacity and performance service level requirements.
Cluster switches	Data	Customer and NetApp/partner	Provides cluster traffic pathway among three or more storage controllers. If the configuration consists of two controllers, then switchless cluster configuration is used.
Data switches	Data	NetApp/partner only	Data connectivity between user and KFS storage. Cisco Nexus 9K switches are selected to provide enough ports for KFS storage controllers and customer data network connectivity providing bandwidth and flexibility to provide 10/25/50/100 GbE connectivity.

Component	Plane	Operation Model	Purpose
Management switches	Control	NetApp/partner only	KFS devices' management port connectivity. Cisco Nexus 9K 1 GbE switches are selected to provide enough ports to attach to the devices' management ports, as well provide 10GbE data connectivity to the management servers and storage.
Firewalls	Control	NetApp/partner only	Limit access to and protect KFS management network and KFS components. Palo Alto firewalls are selected to provide segregation of the KFS management network from the customer network.
Management servers	Control	NetApp/partner only	Executes KFS monitoring and management applications: NetApp Service Engine API, NetApp Service Engine GUI, OpsRamp, Active IQ Unified Manager.
Management storage	Control	NetApp/partner only	Provides shared storage for management servers and applications. Small NAS-based storage system is selected to meet the requirements of NetApp Service Engine.
Console switch	Control	NetApp/partner only	Provides serial console access to KFS devices.

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