Service Management

NetApp Keystone

NetApp
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Overview

This section details the process adopted by the Keystone Operations team to assure the quality and availability of the Keystone service.

Health Monitoring and Alerting

NetApp GSSC performs a series of health checks on a daily basis and also have alerts and notifications, which immediately trigger email notifications. Below are some of the activities performed by NetApp GSSC team:

- Health checks of the infrastructure executed daily, covering configuration, availability, performance and capacity. Health checks also encompasses switches, controllers, firewalls and storage.
- Verify software and firmware information to ensure latest patches are applied.
- Perform a quarterly audit of the configuration settings and compare it against the service baseline.

All storage systems must have NetApp Active IQ enabled and other monitoring tools deployed, controls in place to ensure the environment does not exceed the recommended operating capacity requirements and ensure performance thresholds are set to maintain SLAs. The monitoring solution also has the capability to notify the NetApp GSSC team of a failure of any physical component through OpsRamp, which triggers email alerts to NetApp GSSC team.

Capacity and Performance Management

On a daily basis, NetApp GSSC monitors the following events:

The customer is not informed or impacted by these activities, which illustrates how NetApp is ensuring the Keystone service doesn't cause any disruption to the customer.

- Monitor total capacity used and what is available
- Monitor metrics to ensure SLAs can be met
- Detect unexpected operational events
- Provide proactive break-fix when an operational event is detected on ongoing basis
  - Hardware issues, hard drive errors, network interface errors, power issues, and so on

AutoSupport must be enabled on all storage devices

Capacity and performance management procedures are necessary to ensure that NetApp has a plan to proactively monitor and manage the service infrastructure. This facilitates the adequate provisioning of existing infrastructure while providing a view of future usage of the service based on trending characteristics measured by the NetApp team.

Capacity and performance management follows standard ITIL processes, which ensure that both capacity and performance are:

- Monitored
- Measured

- Acted upon
- Reported on

The Keystone team proactively monitors and manages the capacity usage and performance. This process ensures capacity requirements are met in terms of usable space and performance, while providing a view of future usage based on trending characteristics. In addition to monitoring capacity, the KSM holds capacity planning meetings with the customer and receives forecast information for proactive planning and deployment of additional capacity as required.

Capacity forecasting is based on the jointly-agreed projected capacity forecast plan. The plan and timetable for deployments are necessary in order to determine the delivery schedule for NetApp to deploy hardware into the customer's data centers. Any changes or unforeseen adjustments to the capacity plan might result in a change to the expected hardware deployment configurations and deployment timeframe.

It is important to establish robust processes internally to communicate the following topics to NetApp:

- **Incremental growth.** Growth projections of existing data covering short and medium to long-term requirements from the internal lines of business.
- **New growth.** Based on projects, new requirements from the internal lines of business.
- **Customer growth.** Growth projections from sales for new customers or anticipated growth of existing customers with short and medium to long-term requirements.

NetApp will continually monitor the capacity being used in the environment at a given time. Should the actual capacity written to the KFS environment exceed the forecasted capacity, NetApp will provide advance notice detailing the remaining capacity available for the given hardware deployment period.

During the proactive analysis, if capacity and performance issues are identified, and if it is determined that SLAs are unable to be met, additional capacity or controllers will be deployed by NetApp at no additional cost to the customer. The NetApp installation team will coordinate with the customer for data center access to perform the necessary changes.

The following section describes the tasks and responsibilities that relate to the capacity and performance management.

Tasks	GSSC	Customer
Review capacity reporting with customer	R, A	C, I
Remediate capacity issues	R, A	I
Gather project pipeline requirements	R, A, C, I	I
Forecast and report capacity demand	R, A, C	C, I
Alert customer of any capacity/performance issues	R, A	C, I
Identify and alert on performance issues	R, A, C	I
Remediate capacity/performance issues	R, A	I

Maintenance

This section details the proactive or critical maintenance activities and scheduling to ensure reliable delivery of the Keystone service.

Coverage

NetApp will perform update and maintenance activities for all NetApp provided equipment as required, including:

- Storage system/operating system upgrades
- Disk firmware upgrades
- Shelf firmware upgrades
- Active IQ Unified Manager updates
- Operating system and application patching for NetApp Service Engine systems
- Switch firmware upgrades

Severity Level

The Keystone service security levels include:

- **Standard.** Maintenance activity not affecting availability or performance (most).
- **Disruptive**. Maintenance activity that might affect availability or performance (very few).
- **Critical.** Maintenance activity that might or might not affect availability or performance but required to be performed at earliest opportunity (rare; for example, related to data corruption).

Notification and Scheduling

- The KSM communicates activity details and works with the customer to schedule based on severity.
- For noncritical updates, NetApp provides at least a one-month notice within which to schedule.
- Due their nature, critical updates (for example, data corruption) must be performed at the earliest opportunity, but within the recommended time frame.

  If a critical update is not scheduled within the recommended time frame, then any decrease in performance or availability will not be counted against performance or service availability SLAs.

SLAs

Scheduled maintenance down time, if any, will not be counted against performance or service availability SLAs.

System Expansion

NetApp will deploy the initial system based on current and future anticipated capacity and performance requirements and outlook, in addition to certain assumptions, such as the data efficiencies factor. This is to ensure sufficient infrastructure is being deployed to avoid adding additional infrastructure soon thereafter.

Although there are no specific thresholds that trigger an automatic controller or disk/SSD additions, capacity consumption and performance levels are monitored and alerts are provided to the KSM starting at 70% of provisioned committed capacity and at 60% of physical usable capacity, or 80% of controller utilization. KSM determines if additional infrastructure must be deployed to deliver contracted capacity and performance; if so, KSM initiates the add capacity/performance process.

Alternatively, a customer might request an increase to the committed capacity through the NetApp Service Engine portal. If additional capacity at the requested performance level can be made available based on existing deployed equipment, it will be enabled for use; otherwise, KSM will initiate the add capacity/performance process.

Reporting

The capacity trending report displays capacity usage over time for each storage service in a subscription, with the capability to view when the bursts were used.

The NetApp GSSC team collects various information from the infrastructure that is deployed at customer sites to produce reports for internal purposes and also for customers to view their service performance.

For example, the consumed capacity trending report shown in the below figure.

The below table summarizes the reports available, the delivery method, and the frequency.

Reports	Delivery method	Frequency
File share inventory report – inventory on all the file shares that are created	NetApp Service Engine	Real-time
Disks inventory report – inventory on all the file shares that are created	NetApp Service Engine	Real-time
Object inventory report – inventory on all the file shares that are created	NetApp Service Engine	Real-time

Reports	Delivery method	Frequency
Consumed capacity trending report	NetApp Service Engine	Updated every five minutes
Status of service requests	NetApp Service Engine	Real-time
Adhoc reports	On request	
Additional reports on SLA achieved, quality reports such as the number of incidents, average time taken to resolve, and detailed capacity reporting highlighting trending	KSM	Monthly/quarterly

The customer provides the following reports to KSM with regard to capacity management, during the term at the frequencies shown in the below table, so that the customer can rely on the service levels relating to capacity management.

Sub-Category	Description	Minimum Frequency	Minimum Granularity	Historical Record
Project demand plan	Report of known project demand for storage services categorized by tier	Monthly	Weekly	24 months
Strategic plan	Strategic forecast of major projects over the 6 to 12-month horizon	6 months	Quarterly	n/a

Additional Information and Support Contact

The NetApp Global Services and Support Center (GSSC) team primarily support the services to Keystone customers.

Raise a ticket directly from the NetApp Service Engine portal (**Support > Service Requests**) with the appropriate details of the issue for assistance.

You can also use the following information to reach out to the support team.

- Global Service Contacts :
  https://www.netapp.com/us/contact-us/support.aspx
- If you have an open case/ticket that needs to be escalated, please send an email to one of the following addresses:
  Keystone.services@netapp.com
  Keystone.escalations@netapp.com
- NetApp uses OpsRamp, a cloud-based remote gateway solution to proactively monitor and connect to the Keystone environment for troubleshooting purposes. For information on OpsRamp, see https://www.opsramp.com/#.

To learn more about the information that is described in this document, review the following documents and/or websites:

- NetApp Keystone
  https://www.netapp.com/us/solutions/keystone/index.aspx
- NetApp Product Documentation
  https://docs.netapp.com