



# NetApp Keystone Flex Subscription

## NetApp Keystone

NetApp  
March 11, 2021

This PDF was generated from [https://docs.netapp.com/us-en/keystone/nkfsosm\\_keystone\\_service\\_capacity\\_definitions.html](https://docs.netapp.com/us-en/keystone/nkfsosm_keystone_service_capacity_definitions.html) on March 11, 2021. Always check docs.netapp.com for the latest.

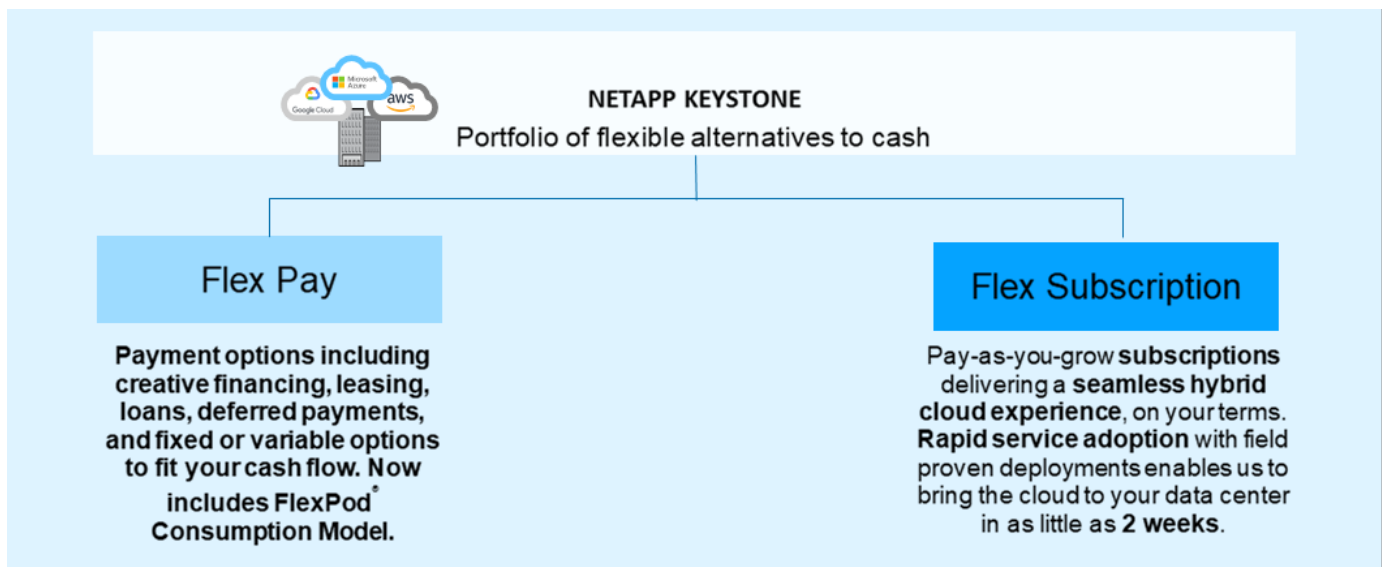
# Table of Contents

- Documentation for NetApp Keystone Flex Subscription ..... 1
  - Flex Subscription ..... 1
  - Flex Subscription service terms and descriptions ..... 3
  - Operational model, roles, and responsibilities ..... 6
  - Flex Subscription infrastructure ..... 8
  - Site requirements ..... 9
  - Flex Subscription Services Operations ..... 10

# Documentation for NetApp Keystone Flex Subscription

NetApp Keystone Flex Subscription is a part of the NetApp Keystone service offering. NetApp Keystone is a portfolio of on-premises capital expenditure (capex) alternatives to enable the on-ramp to cloud journey, which includes NetApp Keystone Flex Pay and NetApp Keystone Flex Subscription services.

- **NetApp Keystone Flex Pay** - NetApp Keystone Flex Pay (Flex Pay) is a portfolio of flexible financial alternatives that include traditional financing, leasing, and fixed/variable options to meet your customer's cash flow needs.
- **NetApp Keystone Flex Subscription** - NetApp Keystone Flex Subscription (Flex Subscription) is pay-as-you-grow, outcome-based subscription service that brings an on-premises cloud-like experience.



## Flex Subscription

Flex Subscription is an outcome-based, on-premises, subscription service model. It enables customers to accelerate time to value by reducing the hurdles related to managing the unpredictable capacity growth and going through the complex procurement cycles. Flex Subscription allows customers to align economics and operations to their business priorities.



**Prefer 100% opex**  
(no asset ownership)



**Single orchestration**



**Monitor, manage, & optimize usage**



**Flexible terms**  
(choice of term & capacity)



**Cloud economics on premises**

Flex Subscription is a subscription-based service offering that provides storage capacity, at predefined performance service levels, for block, file, and object data types that can be deployed on-premises and can be operated by NetApp, a partner, or the customer. In addition to the base service that Flex Subscription provides, add-on services can be chosen at an additional cost. These services are described in the below figure.

- **Data Protection Basic** service provides NetApp SnapMirror and NetApp SnapVault capabilities with default settings.
- **Data Protection Advanced** provides a service with SLAs of RPO=0 by leveraging the NetApp MetroCluster capabilities.



Flex Subscription uses SnapVault technology for backup operations and SnapMirror for disaster recovery to replicate the data remotely; it does not automatically fail over and restore applications.



### Base package

All Flex Subscription services include:

- FlexVol®, FlexGroup®, protocols, clone, and encryption capabilities by default
- Snapshot™ default: 4 hours, 7 days retention
- Free SnapMirror® for initial ingest, provided Premium Bundle on source system



### DP Basic\*

(for additional fee)

Data protection Basic Services subscription

- Includes SnapVault® and SnapMirror
- Requires additional storage subscription to store replicated data at the target; target can be already purchased and owned NetApp storage
- Disaster recovery snapshot every hour; replicated every 4 hours; retained 7 days
- Backup with SnapVault (snapshot every 4 hours; replicated every 24 hours; retained 7 days)



### DP Adv.\*

(for additional fee)

Data protection Advanced Services subscription

- MetroCluster™ / RPO 0 Service
- Pre-requisite – data protection Basic

\* Available only for file and block data services.

## Benefits of Flex Subscription

Flex Subscription provides the following benefits:

- Frees up IT staff from complicated storage-related tasks and allows them to focus on application management
- Reduces upfront capital investment
- Allows customers to meet their demands without overprovisioning
- Aligns data storage costs with business needs/activity
- Simplifies infrastructure provisioning by bypassing complex organizational procurement procedures
- Keeps data secure on their premises
- Enables proper control over compliance, performance, and security



**Align costs and usage**  
Reduce upfront cash and pay only for what you use, avoiding overbuying and overprovisioning



**Free IT staff**  
Free up IT to focus more on innovation and business priorities and less on typical storage tasks



**Unlock the best of both clouds**  
Scale across clouds easily and leverage the public cloud for bursting, data migrations, DR, backup, and tiering



**Meet regulatory requirements**  
Gain improved performance, data protection, compliance, and security with certified and field-proven deployments and services

## Flex Subscription service terms and descriptions

- NetApp Keystone Flex Subscription (Flex subscription) is available for a minimum of one year and up to three years. After the initial term, the service is renewable on an annual basis. Capacity can be increased in increments as small as 1 TiB.
- The minimum capacity is 100 TiB per site, and each site can have one or more clusters to meet the minimum capacity requirement.
- The 100 TiB capacity can be one single performance level or a combination of levels.
- 20% of burst capacity is available at each site; any burst usage is billed only for that billing period. If you need an additional burst requirements that is greater than 20%, contact support.
- Committed capacity or performance levels cannot be altered during a contract term.
- Increasing capacity or changing to higher performance level during term is allowed; however, moving from a higher performance level to a lower level is not permitted.
- Any change request in the last 90 days of the term requires the customer to renew the service for a minimum of one year.

## Flex Subscription service capacity definitions

The NetApp Keystone Flex Subscription (Flex Subscription) service capacities include:

- **Logical capacity.** Data placed into the Flex Subscription infrastructure by a customer:
  - All Flex Subscription capacities refer to a logical capacity.  
  
For example, if a 1 TiB file is stored on the Flex Subscription infrastructure, then at least 1 TiB of capacity must be purchased.
- **Committed capacity.** Minimum logical capacity billed each month for the duration of the term:
  - Capacity is committed to each performance level.
  - Committed capacity cannot be decreased during the term.
  - Committed capacity and additional performance levels can be added during the term.
- **Burst capacity.** Logical capacity, in excess of committed capacity:
  - Flex Subscription services provides 20% capacity in excess of the committed capacity.
  - Burst capacity can be consumed on an elastic basis and is charged on a daily, average-consumed

basis.

- Burst capacity up to 20% is charged at a same rate as the committed capacity.
- Burst capacity greater than 20% of committed is charged at a premium rate. Contact support for any additional burst requirements greater than 20%.

• **Consumed/provisioned capacity.** Sum of all configured volume sizes:

- Capacity is provisioned through the creation, modification, deletion, or potential auto-growth of volumes.
- Includes snapshots and clones.
- The amount of data stored within provisioned capacity is not considered.
- The amount of data actually written to disk is not considered.

• **Billed capacity.** Monthly bill = (committed capacity [TiB] \* committed rate [\$/TiB]) + (daily average provisioned burst capacity [TiB] \* burst rate [\$/TiB]):

- The monthly bill contains a minimum charge based on the committed capacity.

The monthly bill varies beyond the minimum charge based on daily average burst capacity consumption.

## Performance Service Levels

NetApp Keystone Flex Subscription (Flex Subscription) offers capacity at predefined performance levels.

Each Performance Service Level is defined by its I/O density, which is the ratio of performance (input/output operations per second [IOPS]) and used storage (TiB of stored data) which is IOPS/TiB.

Each volume managed by the Flex Subscription services is associated with a performance service level. All I/O operations and all used storage used on the respective volume are factored into the volume's I/O density calculation.

The below figure defines the performance service levels.

	File and Block						Object	Block		
	Extreme	Extreme w/data tiering <sup>2</sup>	Premium	Premium w/data tiering <sup>2</sup>	Standard	Value	Object	Extreme	Premium	Standard
Workload type	Analytics, databases		VDI, virtualization apps, SW dev		File shares, web servers	Backup	Media repository, archiving	HPC	Video surveillance	Backup
Target IOPS/TiB	6,144	6,144 <sup>1</sup>	2,048	2,048 <sup>1</sup>	128	N/A	N/A	N/A	N/A	N/A
Max IOPS/TiB	12,288	12,288 <sup>1</sup>	4,096	4,096 <sup>1</sup>	512	N/A	N/A	5,500	4,000	N/A
Max throughput MBps (32KB/IOP)	384	384 <sup>1</sup>	128	128 <sup>1</sup>	16	N/A	N/A	43	31	N/A
Latency	<1 ms	<1 ms <sup>1</sup>	< 2 ms	< 2 ms <sup>1</sup>	<17 ms	N/A	N/A	< 0.5 ms	<0.5 ms	N/A
Minimum capacity	100TiB* <sup>^</sup>						1 PiB	100 TiB	100 TiB	300 TiB
Protocols	NFS, CIFS, iSCSI, FC						S3	FC, iSCSI		

\* Minimum one-year term and 100TiB of storage.  
<sup>^</sup>Channel led opportunities: Starts with 15TiB for Extreme

<sup>1</sup> Performance SLAs are applicable for data in hot tier  
<sup>2</sup> Max allowed data in hot tier: 25%

I/O density calculations at the volume level are reported to show peak I/O density during the prior week. The peak performance is determined on an hourly time interval. I/O density reports by volume are generated monthly to gauge adherence to the respective service levels.

## Service Level metrics and definitions

The following terms and definitions are used within the NetApp Keystone Flex Subscription (Flex subscription) service:

- **GiB, TiB, and PiB.** Measurements of data storage capacity using base of 1024 (1 GiB = 1024<sup>3</sup> bytes, 1 TiB = 1024<sup>4</sup> bytes, and 1 PiB = 1024<sup>5</sup> bytes).
- **IOPS/TiB.** The protocol operations per second requested by the application divided by the allocated logical size of the volume.
- **Availability** is measured as a percentage of number of I/O requests successfully responded to by the service, divided by total number of I/O requests made of the service, measured at the service demarcation, in a given month, not including scheduled service downtime or unavailability of required facilities, network or other services to be provided by customer.
- **Durability** is the percentage of data accessed without loss of fidelity, excluding customer-caused deletion or corruption.
- **Target IOPS per TiB.** The guaranteed IOPS for all I/O requests made to a volume before the target IOPS per TiB threshold is reached. Performance on the volume is capped at the selected IOPS per TiB.



The target IOPS per TiB performance metric is calculated based on the logical consumed capacity in TiB.

- **Latency.** Time to service an I/O request received from a client, measured at the service demarcation (storage controller I/O port).

## Data Protection

NetApp Keystone Flex Subscription (Flex Subscription) data protection service can back up your data and is able to recover it if required. The available data protection services are:

- Snapshots of disks and shares
- Backups of disks and shares (requires data protection service as part of the subscription)
- Disaster recovery for disks and shares (requires data protection service as a part of the subscription)



Backup and disaster recovery services are available as add-on services, while Snapshot is available as a part of the basic storage service.

	<b>Single Region Snapshots (Available as a part of the basic storage service)</b>	<b>Multi-region Backup (data protection add-on)</b>	<b>Multi-region Disaster Recovery (data protection add-on)</b>
Use case	Mitigate the risk of user or application data deletion or corruption, not against infrastructure loss or failure	Mitigate the risk of complete loss of data on the primary volume due to infrastructure loss or failure	Mitigate the risk of complete loss of data on the primary volume due to infrastructure loss or failure with a recovery time objective
Policy	Hourly, daily, weekly, and monthly	Number of backups to retain based on hourly, daily, weekly, and monthly Snapshots	1 hour, 4 hours, and daily
Topology	Source only	Backup	Async replication target
Target replication service level <sup>1</sup>	n/a	Standard	Same as primary

<sup>1</sup>Additional storage capacity to be subscribed



Subscription to a basic Flex Subscription service does not automatically back up your data. You should subscribe to add-on data protection services and configure your system for data backup and disaster recovery services. If your storage system is not managed by Flex Subscription services, NetApp can still support protecting the data on your storage system and help in connecting it with your Flex Subscription services. However, NetApp is not responsible for any backup failures.

## Tiering

NetApp Keystone Flex Subscription service includes a tiering capability that identifies less frequently used data and tiers it to a cold storage that is owned, deployed, and managed on-premises by NetApp.

The add-on tiering capability is available only with Extreme and Premium service tiers. NetApp assumes 25% of data is hot and 75% is less frequently used and can be moved to a cold storage.

## Operational model, roles, and responsibilities

NetApp Keystone Flex Subscription (Flex Subscription) offers three operational models for service delivery:

- **NetApp-operated model** allows the customer to subscribe to the offered services (according to the selected performance tiers and storage service types) and selects the NetApp-operated option at an extra cost. NetApp defines the architecture and products, installs at the customer premises, and manages the day-to-day infrastructure management operations by using NetApp storage and IT resources. Available storage service types are file, block, and object.
- **Partner-operated model** is similar to the NetApp-operated model, but with the partner operating the service for their end customer. In this model, the partner is the referenced contracted party.



- **Customer-operated model** allows the customer to subscribe to an offered service, according to the selected performance tiers and storage service types. NetApp defines the architecture and products and installs at the customer premises and allows customers to manage the infrastructure using their storage and IT resources.

This figure summarizes the overall service lifecycle model and categorizes the associated services.

### Roles and Responsibilities across Service Lifecycle

	NetApp Operated	Partner Operated	Customer Operated	
	NetApp	Partner	NetApp	Customer
<b>Build</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
• Install	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
• Configure	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
• Deploy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
• Onboard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Monitor &amp; Administer</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
• Monitor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
• Alert	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
• Administer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
• Report	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<b>Operate &amp; Optimize</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
• Manage capacity	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
• Manage performance	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
• Manage SLA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<b>Support</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
• Support customer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
• HW break fix	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
• SW support	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
• Upgrades and patches	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

### Roles and responsibilities summary

The following list summarizes NetApp's roles and responsibilities:

- NetApp delivers, installs, configures, and enables the applicable service (including applicable version of NetApp Service Engine at a customer-designated data center or a CoLo. NetApp is responsible for the uninstallation at the end of the contract term or if the customer chooses to terminate the contract sooner.
- While interfacing with other IT service providers, NetApp cooperates with the customer's IT service providers or their technical team.
- Performance of the NetApp-operated services are included, with the assumption that shared responsibilities are applicable to the supported environment.

# Flex Subscription infrastructure

This section describes the NetApp Keystone Flex Subscription (Flex Subscription) infrastructure architecture and management application for the NetApp and customer-operated environments.

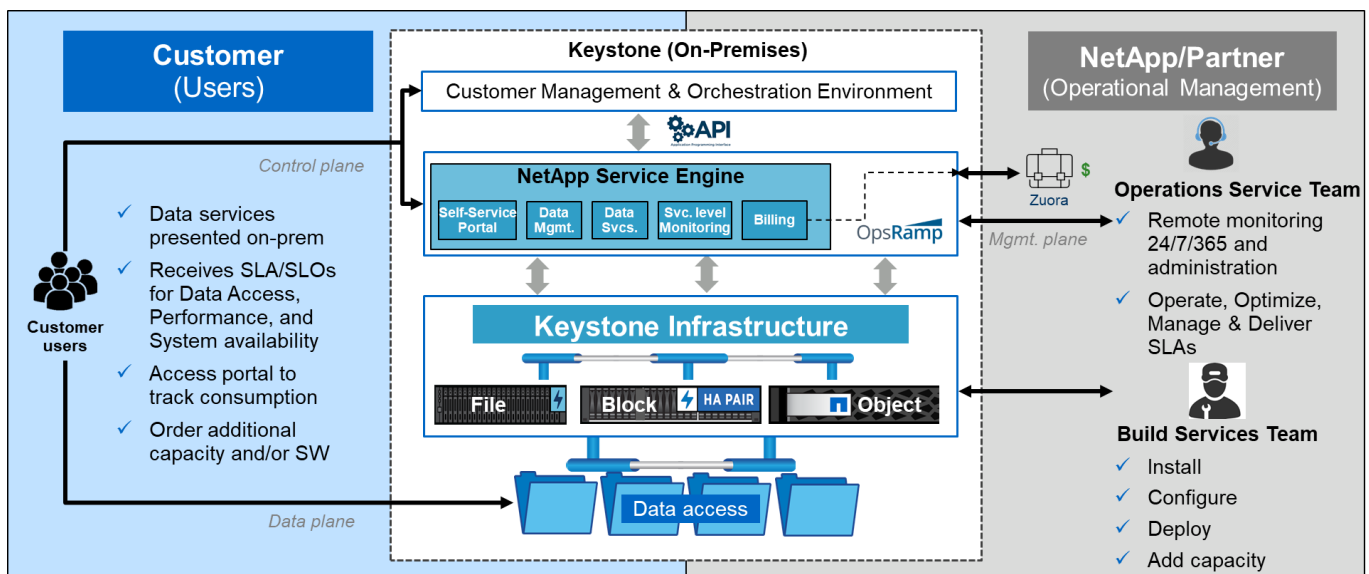
Flex Subscription infrastructure architecture, design, choice of technology, and component products reside solely with NetApp. NetApp reserves the rights to take the following actions:

- Select, substitute, or repurpose products.
- Refresh products with new technology when deemed appropriate.
- Increase or decrease capacity of the products to meet service requirements.
- Modify architecture, technology, and/or products to meet service requirements.

The Flex Subscription infrastructure includes multiple components:

- User interface (web portal) of NetApp Service Engine.
- NetApp Service Engine APIs for integration.
- The Flex Subscription infrastructure that includes storage controllers
- Tools to manage and operate the service such as OpsRamp, Active IQ, and Active IQ Unified Manager.

For more information about NetApp Keystone integration with Active IQ, see [Active IQ Digital Advisor Documentation](#)

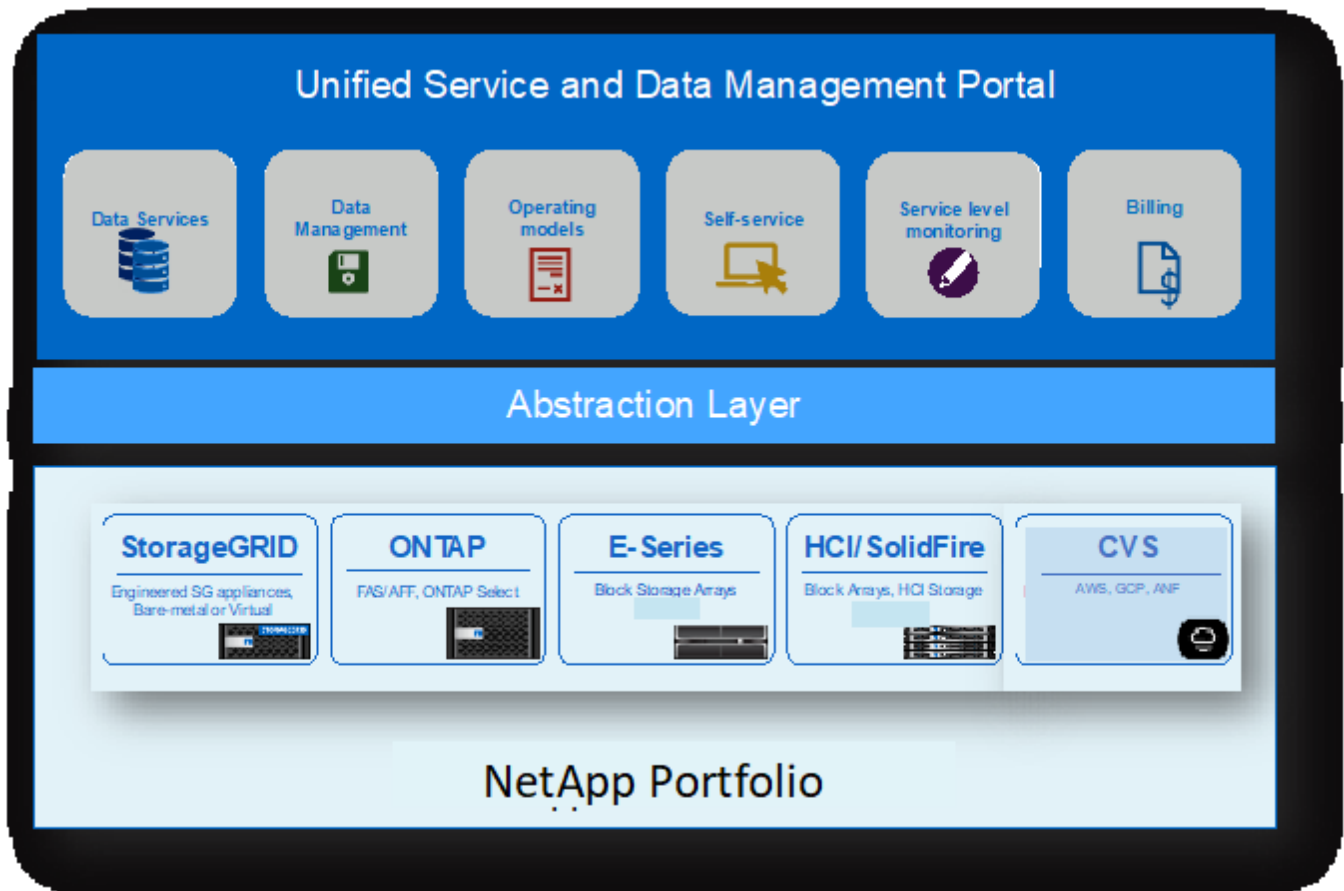


## NetApp Service Engine

You can use the NetApp Service Engine web portal to manage and monitor your Flex Subscription 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 NetApp Service Engine 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.

## Site requirements

There are multiple requirements for enabling NetApp Keystone Flex Subscription (Flex Subscription) services in your environment, such as space, racks, PDUs, power, and cooling, with additional network and security requirements discussed later.

## **Space**

Floor space to host the Flex Subscription infrastructure equipment (to be provided by customers). NetApp provides the weight specifications based on the final configuration.

## **Racks**

Four post racks in the customer-operated offering (to be provided by customers). In the NetApp-operated offering, either NetApp or the customer can provide the racks, depending on requirements. NetApp provides 42 deep racks.

## **PDU**s

You should be providing the power distribution units (PDUs), connected to two separate, protected circuits with sufficient C13 outlets. In the customer-operated offering, in some cases, C19 outlets are required. In the NetApp-operated offering, either NetApp or the customer can provide the PDUs, depending on requirements.

## **Power**

You should provide the required power. NetApp will provide the power requirement specifications based on 200V rating (Typical A, Max A, Typical W, Max W, Power cord type, and quantity), based on the final configuration. All components have redundant power supplies. NetApp will provide the in-cabinet power cords.

## **Cooling**

NetApp can provide the cooling requirement specifications (Typical BTU, Max BTU), based on the final configuration and requirement.

## **Networking**

Depending on customer requirements and the storage controllers used, NetApp can provide 10 Gb, 40 Gb, and 100 Gb connectivity at the customer site.

NetApp provides the required transceivers for NetApp-provided Flex Subscription infrastructure devices only. You should supply transceivers required for customer devices and cabling to the NetApp-provided Flex Subscription infrastructure devices.

# **Flex Subscription Services Operations**

NetApp Keystone Flex Subscription Services are run by leveraging the NetApp Global Services and Support Center (GSSC), NetApp Keystone Success Manager, and NetApp Keystone Service Delivery Manager.

## **NetApp Global Services and Support Center (GSSC)**

NetApp provides operational services remotely to NetApp Keystone customers. These services encompass a range of operational disciplines across storage management activities, including asset and configuration management, capacity and performance management, change management, event, incident and problem management, service request fulfillment, and reporting. NetApp will demonstrate a state of control and supporting evidence available as required.

## Additional Information and Support Contact

The NetApp Global Services and Support Center (GSSC) team primarily support the services to NetApp Keystone Flex Subscription 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](mailto:Keystone.services@netapp.com)  
[Keystone.escalations@netapp.com](mailto:Keystone.escalations@netapp.com)
- NetApp uses OpsRamp, a cloud-based remote gateway solution to proactively monitor and connect to the NetApp 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>

## Copyright Information

Copyright © 2021 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system-without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

## Trademark Information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.