NetApp®

Keystone® Storage-as-a-Service Service Description

1. General

This Service Description describes the On-Premises and Hybrid Cloud, consumption-based, STaaS Services that are available to an End User pursuant to the Keystone STaaS Terms, incorporated herein. This Service Description also incorporates by reference the corresponding Service Description Supplement.

1.1 Definitions.

Capitalized terms not specifically defined in this Service Description have the same meaning as in the Keystone STaaS Terms. In addition, the following definitions apply to this Service Description.

a) **"Additional STaaS Services":** the optional or mandatory services that are available as part of the STaaS Services, subject to additional fee amounts, conditions, and availability, with further details provided in Section 3.
b) **"AFX":** NetApp disaggregated storage platform.
c) **"AFX Cluster":** the collection of AFX storage controllers and AFX storage shelves connected to same AFX storage network.
d) **"Burst Capacity Limit":** the amount of Usable Capacity, beyond Committed Capacity, per Performance Service Level Instance or per AFX Cluster, per Order, with further details provided in Section 2.2(c)(i).
e) **"Burst Waiver Period":** the number of days, from the Start Date, for which Burst Capacity usage will be metered and reported, but not charged, with further details provided in Section 2.2(c)(iii).
f) "**CVO**": NetApp's Cloud Volumes ONTAP® software.
g) "**Commingling**": the incorporation of STaaS Products and non-STaaS Products in the same ONTAP cluster or StorageGRID® grid.
h) **"Data Infrastructure Insights":** NetApp's hybrid multi-cloud infrastructure monitoring, analysis, insights, and optimization tool, as described in https://docs.netapp.com/us-en/data-infrastructure-insights/.
i) "**Data Storage Type (DST)**": one of the following data storage methods: Unified (File, Block, S3 Object), Block Optimized, Object, or AFX.
j) "**Effective Capacity**": the amount of storage capacity equal to the Usable Physical Capacity multiplied by a data efficiency factor (>= 1).
k) "**Hybrid Cloud Service**": On-Premises Service and, optionally, CVO ordered on a single, co-termed Order and charged on Keystone invoice, with ability to reallocate spend from On-Premises Service to CVO.
l) **"IOPs"** means input/output operations per second.
m) "**Logical Capacity**": the amount of storage capacity required to store End User data before Storage Array data efficiencies.
n) "**On-Premises Service**": Keystone STaaS delivered through STaaS Products deployed at End User Site.
o) "**Performance Service Level (PSL)**": one of the Performance Service Levels of a given Data Storage Type, defined in Section 2.3(a).
p) "**Performance Service Level Instance (PSLI)**": one Storage Array of a given Performance Service Level of the Unified or Block Optimized Data Storage Type, or one AFX storage controller of a given Performance Service Level of the AFX Data Storage Type.
q) "**Physical Capacity**": the amount of data storage capacity based on quantity and size of physical media blocks.
r) "**Provisioned Capacity**": the amount of thick or thin, Physical Capacity or Logical Capacity allocated for use.
s) "**Secure Site**": End User Site with limited or no ability to provide internet access or install or enable Monitoring Tools for metering, monitoring, or support purposes.
t) "**Service Level**": one of the service levels described in Section 2.3.
u) "**Start Date**" has the meaning ascribed to it in Section 4.3.
v) "**Service Level Agreement (SLA)**": a guarantee provided for meeting a Service Level Objective.
w) "**Service Level Objective (SLO)**": the quantification and delivery goal of a performance metric objective.
x) "**Storage Array**": a data storage device consisting of two storage controllers ("H/A pair") and dedicated internal and/or externally attached storage media.
y) **"Target Start Date":** date on which End User is targeting start of STaaS Services.
z) "**Usable Capacity**" means the amount of Physical Capacity or Logical Capacity available to store End User data.

1.2 Partners.

STaaS Services described in this Service Description may be provided to End User by NetApp or a NetApp Partner. Partner may also assume some of the responsibilities of NetApp under this Service Description.

2. STaaS Features and Services

2.1 Data Storage Types.

a) **Unified**: delivered on NetApp ONTAP AFF and/or FAS platform Storage Arrays.
b) **Block Optimized**: delivered on NetApp ONTAP ASA platform Storage Arrays.
c) **Object:** delivered on NetApp StorageGRID platform Storage Arrays.
d) **AFX:** delivered on NetApp AFX Cluster.

2.2 Capacity.

a) **Committed Capacity**
   i. Use of the STaaS Services requires a subscription to a certain amount of Committed Capacity per Unified or Block Optimized PSLI, or per AFX Cluster, per Order, subject to minimum Committed Capacities and capacity increase increments as set forth in Section 2.3(a).

b) **Consumed Capacity**
   i. **Unified or Block Optimized Data Storage Type.**
      - Logical Capacity Metering: Consumed Capacity is calculated, per PSLI, as the amount of metered Logical Capacity (i.e. before Storage Array data efficiencies) in use to store all instances and types of End User data (e.g. copies, mirrored copies, versions, clones), plus Physical Capacity in use to store metadata and differential data of Snapshot™ copies and certain clones, plus any thick-provisioned Physical Capacity.
      - Physical Capacity Metering: Consumed Capacity is calculated, per PSLI, as the amount of metered Physical Capacity (i.e. after any Storage Array data efficiencies) in use to store all instances and types of End User data (e.g. copies, mirrored copies, versions, clones), plus Physical Capacity in use to store metadata and differential data of Snapshot™ copies plus any thick-provisioned Physical Capacity.

   ii. **Object Data Storage Type.** Consumed Capacity is calculated as the amount of metered Physical Capacity in use to store all instances and types of End User data on all nodes based on information lifecycle management (ILM) policy(ies) configured.

   iii. **Cloud Volumes ONTAP.** Consumed Capacity is calculated as the amount of metered Provisioned Logical Capacity of all CVO volumes.

   iv. **AFX Data Storage Type.** Consumed Capacity is calculated, per AFX Cluster, as the amount of metered Physical Capacity (i.e. after any Storage Array data efficiencies) in use to store all instances and types of End User data (e.g. copies, mirrored copies, versions, clones), plus Physical Capacity in use to store metadata and differential data of Snapshot™ copies plus any thick-provisioned Physical Capacity.

c) **Burst Capacity**
   i. **Burst Capacity Limit.** STaaS Services provide a default Burst Capacity Limit of 20% of Committed Capacity, per PSLI, or per AFX Cluster, with additional options provided in Section 3.2.

   ii. **Burst Rate.** Burst Capacity consumption will be invoiced at the specified Committed Capacity rate corresponding to the selected DST and PSL.

   iii. **Burst Waiver Period.** STaaS Services provide a Burst Waiver Period of sixty (60) days from the Start Date.

2.3 Service Levels

(a) Performance Service Levels.

(i) Unified

Data Storage Type	**Unified** (ONTAP)			
Supported protocols	FC, iSCSI, NFS, NFSv4/RDMA, NVMe/FC, NVMe/TCP, SMB, S3			
Performance Service Level (all specifications per PSLI ["H/A Pair"])	**Extreme**	**Premium**	**Standard**	**Value**
Example Workloads	AI/ML, HPC, InMem DB	Analytics, EDA, OLTP	OLAP, IoT, Containers	Backup, Archive
Target 90th percentile Latency	<= 1ms	<= 1ms	<= 4ms	> 4ms
Target Maximum IOPS*, **	1M	550K	250K	N/A
Target Maximum GBps*, **	40	20	10	N/A
Platform	AFF A-Series		AFF C-Series	FAS
Min Committed Capacity	50 TiB		100 TiB	100 TiB
Committed Capacity increase increment	25 TiB			
Committed and Metered Capacity type	Logical Capacity or Physical Capacity			

* Mutually exclusive targets. Actual performance may differ based on various factors, including OS version, HW, workload type and simultaneity.
** IOPS: ONTAP 9.16.1; NFS; Random; 70%R/30%W; 8K block size; 1ms latency (4ms for Standard). Throughput: ONTAP 9.16.1; NFS; Sequential, 100% R; 32K block size.

(ii) Block Optimized

Data Storage Type	**Block Optimized** (ONTAP)		
Supported protocols	NVMe/TCP, NVMe/FC, FC, iSCSI		
Performance Service Level (all specifications per PSLI ["H/A Pair"])	**Extreme**	**Premium**	**Standard**
Example Workloads	SAP HANA, Oracle, MS SQL Server, EPIC		

Target 90th percentile Latency	<= 1ms	<= 1ms	<= 4ms
Target Maximum IOPS*, **	850K	450K	120K
Target Maximum GBps*, **	65	25	6
Platform	ASA A-Series		ASA C-Series
Min Committed Capacity	50 TiB		100 TiB
Committed Capacity increase increment	25 TiB		25 TiB
Committed and Metered Capacity type	Logical Capacity or Physical Capacity		

* Mutually exclusive targets. Actual performance may differ based on various factors, including OS version, HW, workload type and simultaneity.
** IOPS: ONTAP 9.16.1; FCP; Random; 70%R/30%W; 8K block size; 1ms latency (4ms for Standard). Throughput: ONTAP 9.16.1; FCP; Sequential, 100% R; 64K block size.

(iii) Object

Data Storage Type	**Object** (StorageGRID)	
Supported protocols	S3	
Performance Service Level	**Standard**	**Value**
Platform	SGF6112	SG6160
Min Committed Capacity per Order	200 TiB	500 TiB
Committed Capacity increase increment	25 TiB	100 TiB
Committed and Metered Capacity type	Physical Capacity	

(iv) Cloud Volumes ONTAP

Data Storage Type	**Cloud Volumes ONTAP**
Supported Protocols	NFS, CIFS, iSCSI, S3* (*AWS & Azure only)
Platform	CVO
Min Committed Capacity per Order	4 TiB
Capacity Increase Increment	1 TiB
Committed and Metered Capacity type	Logical Capacity

(v) AFX

Data Storage Type	**AFX** (ONTAP)
Supported Protocols	NFSv3, NFSv4/RDMA, pNFS, SMB, S3
Performance Service Level (all specifications per PSLI [one AFX storage controller])	**Extreme**
Example Workloads	AI/ML, HPC, InMem DB
Target 90th percentile Latency	<= 1ms
Target Maximum IOPS *, **	625K
Target Maximum GBps *, **	20
Platform	AFX
Min Committed Capacity (per AFX Cluster)	200 TiB
Committed Capacity increase increment	100 TiB
Committed and Metered Capacity type	Physical Capacity

* Mutually exclusive targets. Actual performance may differ based on various factors, including OS version, HW, workload type and simultaneity.
** IOPS: ONTAP 9.18.1; NFSv4; Random; 70%R/30%W; 4K block size. Throughput: ONTAP 9.18.1; NFSv4; Sequential, 100% R; 64K block size.

(b) Service Level Objectives (SLOs)

(i) **Availability SLO**. Target 99.999% service availability, per PSLI, for Unified and Block Optimized DST, or per AFX storage controller. Service Level Agreement (SLA) is available for qualified Orders.

(ii) **Performance SLO**. Target 90th percentile latency, per PSLI, for up to Target Maximum IOPs for Unified (not including "Value" PSL), Block Optimized, and AFX DST. Service Level Agreement (SLA) is available for qualified Orders.

(iii) **Service Parts Delivery and Replacement SLO**. Target four hours delivery and on-site replacement, from time need is determined by Keystone Support; where geographically available.

(iv) **Sustainability SLO**. Power consumption up to maximum rated watts of STaaS Products deployed to deliver PSLI for Unified (not including "Value" PSL) and Block Optimized DST, or AFX Cluster. Service Level Agreement (SLA) is available for qualified Orders.

(v) **Technical Support SLO**. Time-to-Respond (TTR) targets, after receipt of incident ticket by Keystone support, based on incident priority level assigned by Keystone support, as provided in Service Description Supplement.

2.4 Features.

a) Unified and AFX Storage DST include use of all *ONTAP One* features on STaaS Products.

b) Block Optimized DST includes use of all *ONTAP One for SAN* features on STaaS Products.
c) Object Storage Data Type includes use of all StorageGRID features on STaaS Products.

2.5 Services.

STaaS Services include the following services, which will be performed by NetApp or NetApp authorized partner or sub-contractor, as applicable:

a) **STaaS Products**. Size, select and provide the STaaS Products required to deliver STaaS Services, including power cords and SR-SFPs for, and network cabling between STaaS Products.
b) **Site Requirements**. Provide End User Site preparation requirements.
c) **Shipping**. Provide initial and final return shipping of STaaS Products.
d) **Installation**. Provide installation for initial, add-on, and updates of STaaS Products.
e) **Activation**. Enable monitoring, metering, invoicing, and support and make STaaS Services available for use.
f) **Metering/Monitoring**. Perform capacity consumption metering and basic health and performance monitoring of STaaS Products and STaaS Services using the Monitoring Tool.
g) **Reporting**. Provide Capacity Report through the Monitoring Tool or with each invoice.
h) **Notification**. Notify End User of basic incidents that may affect delivery or use of STaaS Services through the Monitoring Tool.
i) **Technical Support.** Provide technical support by email or telephone.
j) **On-Site Parts Delivery, Replacement, Support**. Deliver parts and/or send authorized engineers to End User Site, as required.
k) **Capacity, Health, and Performance management**. Manage STaaS Products to deliver STaaS Services.
l) **Updates**. Identify, plan, and optionally install, in coordination with End User, updates and patches required for STaaS Services.
m) **Return**. At Subscription Term expiration, provide packaging (if required), deinstall STaaS Products and arrange for return to NetApp, and sanitize media and reset STaaS Products to factory settings upon return to NetApp facility.

2.6 Keystone Success Management.

STaaS Services include remote Keystone Success Management ("KSM") service, available during local business hours, providing:

a) Conduct, as needed, STaaS Services specific review calls that may include:
    i. General questions regarding STaaS services.
    ii. Subscription consumption and planning.
    iii. STaaS Products maintenance and update planning.
    iv. Invoice review.
    v. Incident review.
b) STaaS escalation management.

3. Additional STaaS Services

The following optional or mandatory services, if noted as such, (each, an "**Additional STaaS Service**") are available, for additional Fees:

3.1 Advanced Data Protection (ADP).

a) Provides MetroCluster™ IP synchronous mirroring feature on supported Unified DST only, AFF storage arrays.
b) Requires ordering of following Additional STaaS Services:
    - Networking (if switches are needed).
    - Keystone Supplemental Services (if MetroCluster IP design or deployment services are needed).

3.2 Burst Capacity Limit.

a) Provides selection of Burst Capacity Limit of 40% or 60% of Committed Capacity.
b) Supported on Unified and Block Optimized DST only.

3.3 Data Infrastructure Insights (DII) for Keystone.

c) Provides DII license for Keystone infrastructure only.

3.4 Data tiering to non-NetApp targets.

a) Provides FabricPool data tiering to supported non-NetApp data storage targets.
b) Supported on Unified DST only.

3.5 Expedited Activation (one-time charge applied to first invoice).

a) Provides expedited handling, delivery, installation, and activation of STaaS Services.

3.6 Keystone Supplemental Services (charge applied to next invoice following delivery).

a) Provides additional remote and/or on-site services for STaaS Services or Products.

3.7 Networking.

a) Provides a switch, including support, deployment, cables for connectivity between Keystone products only, and short range SFPs for provided switches, for cluster interconnect, MetroCluster IP, or storage networking use only.
b) Or, provides one StorageGRID service appliance, including support and deployment.

c) Not applicable for AFX DST.

3.8 Non-returnable Drive (NRD).

a) Provides for End User to retain replaced defective media during Subscription Term.

3.9 Non-returnable – Non-Volatile Components (NR-NVC).

a) Provides option for Customer to retain replaced defective media during Subscription Term.
b) Provides option for Customer to retain functional non-volatile memory components at expiration of the Subscription Term.
c) Non-volatile components include storage media (hard drives and SSDs) and non-volatile memory components that contain Customer data and whose contents cannot be erased or sanitized by removing power or discharging battery or executing firmware or software commands provided by NetApp.

3.10 Physical Capacity Metering.

a) Provides for consumption metering based on Physical Capacity for Unified and Block Optimized DST.
b) ONTAP version 9.14.1 or greater required.

3.11 US Citizen Support (USCS).

a) Provides installation, parts replacement, support, and KSM services from U.S. citizens on U.S. soil, where geographically available.

4. Order

4.1 Order type.

STaaS Services provide two, non-convertible order types:

a) On-Premises Service.
b) Hybrid Cloud Service.

4.2 Subscription Term.

a) STaaS On-Premises Service offers up to 5-year Term.
b) STaaS Hybrid Cloud Service offers up to 3-year Term with co-termination of On-Premises Service and CVO.

4.3 Start Date.

Date on which Subscription Term starts and Fees begin to accrue that is the earlier of, either:

a) Date on which NetApp notifies End User that STaaS Services have been activated and available for use.
b) 30 days from STaaS Products ship date, if STaaS Services cannot be activated within 30 days after STaaS Products ship date due to End User delays, as determined by NetApp

5. Fees

5.1 Capacity Reports

NetApp will use the Capacity Reports to calculate the Fees due under each invoice for STaaS Services and such Capacity Reports will be deemed to contain the final and conclusive summary of the Consumed Capacity used by End User during the applicable billing period, unless End User can establish that such Capacity Report contains a material error.

5.2 Minimum Payment.

Each Order is subject to a Minimum Payment amount that is payable during the applicable billing period identified in the Order.

5.3 Hybrid Cloud Service.

a) Minimum payment for Hybrid Cloud Service may include an amount based on metered Provisioned Capacity of all CVO volumes.
b) Fees payable by End User for Hybrid Cloud Service do not include AWS, Azure, or other cloud service provider charges, which must be paid by End User and cloud services connectivity maintained for so long as CVO is being used.

5.4 Total Fees.

The total Fees payable for a billing period are determined for each billing period and will include Minimum Payments, additional usage-based consumption charges for any Burst Capacity as described in Section 2.2 and/or fixed rate charges.

6. Invoicing

Fees payable for a billing period will be included in a single invoice and will identify the components of such Fees. End User will be invoiced in accordance with the invoice period selected in the Order.

a) **Monthly, in arrears** (applicable to On-Premises Service or Hybrid Cloud Service).
   - First and last month invoices may be pro-rated, on per day basis, if Start Date is not first of month.
b) **Annual, in advance** (applicable to On-Premises Service, only).
c) **Quarterly, in advance** (applicable to On-Premises Service, only).
d) **Semi-Annual, in advance** (applicable to On-Premises Service, only).

7. Subscription Modifications

7.1 Committed Capacity Increase.

a) Up to 90 days prior to the scheduled expiration of the Subscription Term, End User may request an increase to Committed Capacity of an existing PSLI, or an AFX Cluster, in increments specified in Section 2.3(a).
b) Once activation of additional Committed Capacity is communicated to End User, any increases will remain in effect for the remainder of the Subscription Term, and the Minimum Payment will be revised to reflect the increase.
c) Where End User has selected in advance billing, NetApp will promptly invoice End User for any pro-rated increases in Minimum Payments owed for the remainder of current invoice period.

7.2 Committed Capacity Decrease.

Applicable to Keystone On-Premises Service only. If End User has selected a Subscription Term of not less than 24 months, End User may decrease the Committed Capacity subject to certain limits for capacity decrease amounts and Minimum Payments set forth in the Service Description Supplement.

7.3 Reallocation.

a) In Hybrid Cloud Service only, End User can reallocate On-Premises Service spend to CVO spend quarterly (up to 25% of then current annual contract value).
b) Post reallocation, On-Premises Service monthly Minimum Payment per Order must be greater than $16,666 (or US currency equivalent).

8. Monitoring Tool

STaaS Services require full and continuous enablement of:

a) NetApp ONTAP AutoSupport® (ASUP), on each Storage Array or AFX storage controller, configured to send usage information daily.
b) Monitoring Tool on End User provided and managed VMs, at each End User Site.

9. End User Responsibilities

9.1 Administration and operation.

End User is responsible for the administration and operation of the STaaS Products, including, but not limited to the following.

a) Configuration, use, operations, and management of ONTAP or StorageGRID features.
b) Storage Array capacity and resources consumption resulting from ONTAP or StorageGRID feature(s) use.
c) ONTAP data SVM configuration.
d) End User specific patch identification and installation.
e) Storage Provisioning.
f) Equipment moves during subscription term (after notifying and upon gaining NetApp approval).
g) Enhanced reporting or monitoring of STaaS Products.

9.2 Data protection, security, and management.

End User is responsible for designing, configuring, administering, and maintaining:

a) Physical, network, and access security.
b) Data-at-rest and data-in-flight encryption.
c) All aspects of End User data backup and recovery and business continuity/disaster recovery.
d) Integration and/or automation of the STaaS Services with End User environment or applications.
e) Adherence to End User applicable industry or government compliance requirements.
f) Data migration to/from STaaS Products.

9.3 Subscription expiration, cancellation, termination.

NetApp is not responsible for access to, availability, or loss of End User data on STaaS Products after end of subscription term.
By end of Subscription Term, End User must:

a) Discontinue use of STaaS Services.
b) Backup, migrate, delete, and/or sanitize media (without rendering media unusable), if and as required by End User.
c) Notify NetApp that STaaS Services can be deactivated and schedule deinstallation date (within 15 days of end of Subscription Term).
d) Transport packaged items to End User shipping area for return pickup.
e) All effort, hardware, software, or services related to transferring End User data from STaaS Services are not included as part of STaaS Services or Fees.
f) End User may receive an extension of STaaS Services beyond the Subscription Term, for express purpose of an orderly transfer of End User data out of Services, contingent on NetApp approval. The following terms and conditions apply:
    i. End User needs to provide a written request to NetApp at least 90 days prior to expiration of the current Subscription Term.
    ii. Allowance is made for a period of one calendar month, at pro-rated, on per day basis fees.