NetApp®
XaaS with NetApp Keystone® End User Service Description

1.   General

This Service Description describes the XaaS with NetApp Keystone® Services that are available to End User when procured through a NetApp Lifecycle Services Certified (LSC) partner. This Service Description is different to the Keystone® STaaS Service and to differentiate the service will be called as, XaaS with NetApp Keystone®.

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.

i.   "**Additional Services**": Optional services that are available as a part of the XaaS with NetApp Keystone® Service, subject to additional fee amounts, conditions and availability from the Partner provided service.

ii. "**Burst Capacity Limit**": Amount of Usable Capacity, beyond Committed Capacity, per Performance Service Level Instance, per Order.

iii. "**Commingling**": The incorporation of NetApp products belonging to this service and NetApp products purchased outside of this service in the same ONTAP cluster or StorageGRID grid.

iv. "**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/.

v.   "**Data Storage Type (DST)**": One of the following data storage methods: Unified (File, Block, S3, Object), Block Optimized, or Object.

vi. "**Deployment Service**": Physical installation and configuration of NetApp technologies procured through XaaS with NetApp Keystone® Service.

vii. "**Performance Service Level (PSL)**": One of the Performance Service Levels defined in Section 2.3.

viii. "**Performance Service Level Instance (PSLI)**": One Storage Array of a given Performance Service Level of Unified or Block Optimized Data Storage Type.

ix. "**Physical Capacity**": The amount of data storage capacity based on quantity and size of physical media blocks.

x.   "**Service Level Objective (SLO)**": The quantification and delivery goal of a performance metric objective.

xi. "**Subscription Start Date**" Date on which Subscription Term starts and Fees begin to accrue.

xii. "**Storage Array**": a data storage device consisting of two storage controller(s) (e.g. "HA Pair") and dedicated internal and/or externally attached storage media.

xiii. "**Usable Capacity**" means the amount of Physical Capacity available to store End User data.

2.   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.

2.2   Capacity.

a) **Committed Capacity**. Use of XaaS with NetApp Keystone® requires a subscription to a certain amount of Committed Capacity per PSLI, per Order, subject to minimum Committed Capacities and capacity increase increments as set forth in Section 2.3.

b) **Consumed Capacity.**

i.   Unified or Block Optimized Data Storage Type. 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.

c) **Burst Capacity Limit.**
This service provides a default Burst Capacity Limit of 20% of Committed Capacity, per PSLI.

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, InMemDB	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	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	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. 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	

b) Service Level Objectives (SLOs).
i. Performance SLO. Target 90th percentile latency, per PSLI, up to Target Maximum IOPs for Unified (not including "Value" PSL) and Block Optimized Data Storage Types.

2.4 Features.
a) Unified DST includes use of all ONTAP One features.
b) Block Optimized DST includes use of all ONTAP One for SAN features.
c) Object Storage Data Type includes use of all StorageGRID features.

2.5 Services.
XaaS with NetApp Keystone® will include the following services provided by NetApp to the End User. Contact your LSC Partner, reselling this service, for additional service requirements.

a) **Keystone Subscription Products**. Provide NetApp Products required to deliver the service, including power cords and SR-SFPs, and network cabling.

b) **Shipping**. Provide initial and final return shipping of Keystone Subscription Products.

c) **Activation**. Enable reporting, metering and invoicing make XaaS with NetApp Keystone® Services available for use.

d) **Capacity Monitoring.** Perform capacity consumption monitoring.

e) **Reporting**. Provide Capacity Report showing consumption and usable capacity through NetApp Console. Reporting availability will be subject to:

i. NetApp AutoSupport® (ASUP), on each Storage Array, configured to send usage information daily.

ii. LSC Partner onboarding End User into NetApp Console.

f) **On-Site Parts Delivery, Replacement, Support**. Deliver parts and/or send authorized engineers to End User Site, as required.

g) **Return**. At Subscription Term expiration, provide packaging (if required), transportation to NetApp facility and reset Subscription Products to factory settings upon return to NetApp facility.

3.   Additional Services

Additional Services can be added to Subscriptions with greater than 12 months remaining. The following optional services are available, for additional Fees, subject to the LSC Partner offering the service.

3.1   Advanced Data Protection (ADP).

a) Provides MetroCluster IP synchronous mirroring feature on supported AFF storage arrays.

b) Requires ordering of following Additional Services:

- Networking (if switches are needed)
- Keystone Supplemental Services (if MetroCluster IP design or deployment services are needed).

3.2   Data Infrastructure Insights (DII) for " XaaS with NetApp Keystone®".

a) Provides DII license for XaaS with NetApp Keystone® infrastructure only. This is an additional service that provides infrastructure monitoring, analysis, insights, and optimization for Keystone environment. Following terms and conditions apply:

b) Orderable with new subscription or separately, for existing subscription, up to 90 days prior to end of subscription term.

c) Invoiced based on committed and consumed burst capacities, per performance level, per Order.

d) DII for Keystone subscriptions can be part of a new or existing DII tenant.

e) End User or Partner is responsible for installing and configuring DII for XaaS with NetApp Keystone®.

3.3   Data tiering to non-NetApp targets

a) Data Tiering to Non-NetApp Targets is an Additional Service that provides S3 based FabricPool data tiering from Keystone ONTAP systems to NetApp supported non-NetApp S3 data storage targets.

b) Provides FabricPool data tiering to supported non-NetApp data storage targets.

c) Supported on Unified DST only.

d) Consumed Capacity for FabricPool data tiered to supported non-NetApp targets is measured as the amount of Physical Capacity in use to store End User data on a Keystone Unified (File and Block) Performance Level that is tiered to a non-NetApp data storage target

3.4   Networking

a) Provides pair(s) of switches, support, cables for connectivity between XaaS with NetApp Keystone® products only, and short range SFPs for provided switches, for cluster interconnect, MetroCluster IP, or storage networking use only.

b) Provides pair(s) of StorageGRID service appliances, including support.

3.5 <u>Non-returnable Drive (NRD).</u>
a) Provides option for End User to retain replaced defective media during Subscription Term.

4. Order
4.1 <u>Subscription Term</u>.
XaaS with NetApp Keystone® Service offers up to 5-year Term.
4.2 <u>Subscription Start Date</u>.
Thirty (30) days from XaaS with NetApp Keystone® Products ship date.

5. Monitoring Tool
XaaS with NetApp Keystone®, requires full and continuous enablement of NetApp AutoSupport® (ASUP), on each Storage Array, configured to send usage information daily.

6. Subscription Modifications

Changes to the Committed Capacities are subject to the increase or decrease increments and minimum Committed Capacity requirements for each applicable Performance Service Level, as specified in the Section 2.3 Service Levels.

6.1. <u>Committed Capacity Increase.</u>
a) NetApp will provide LSC Partner with confirmation of such increase provided that NetApp will have no obligation to confirm such increase if such increase would require the addition of Subscription Products within 90 days of the expiration of the Subscription Term, unless the Parties have agreed in writing to renew or otherwise extend the Subscription Term prior to or during such final 90-day period.

b) Up to 90 days prior to the scheduled expiration of the Subscription Term, the LSC Partner may request an increase to Committed Capacity of an existing PSLI, in increments specified in Section 2.3 of the "XaaS with NetApp Keystone® End User Service Description".

7. Commingling
XaaS with NetApp Keystone® Services provides Commingling, subject to NetApp approval. Following terms and conditions apply:
a) NetApp approval needs to be obtained prior to submission of Order.
b) The non- XaaS with NetApp Keystone® NetApp ONTAP Storage Arrays within the same ONTAP cluster must be:
   i. Managed by the same LSC Partner who is managing the XaaS with NetApp Keystone® Subscription for the End User.
   ii. Covered with the same level of NetApp backline hardware support services as XaaS with NetApp Keystone® Subscription, for duration of commingling term.
c) All effort, hardware, software, or services related to or required for Commingling (including, but not limited to: feasibility, supportability, designing, planning, managing, additional required hardware or software, cluster switches, SFPs, cabling, hardware or software installation, configuration, software upgrades or downgrades, testing, documenting, return to NetApp supported configuration, etc.) are not included as part of Keystone services or fees.
d) Requires ONTAP version 9.14.1 or higher. This may impact ability to commingle.

8. Renewal
Subscription may be renewed on the same Subscription version noted on Order for as long as that Subscription version is offered.

9. Service Exclusions

9.1 <u>Administration and operation.</u> NetApp will not be responsible for the administration and operation of the XaaS with NetApp Keystone® 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 (LSC Partner is required to notify and gain prior NetApp approval).
   g) Enhanced reporting or monitoring of XaaS with NetApp Keystone® Products.

9.2 <u>Data protection, security, and management</u>.
NetApp will not be 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 XaaS with NetApp Keystone® Services with End User environment or applications.
   e) Adherence to End User applicable industry or government compliance requirements.
   f) Data migration to/from XaaS with NetApp Keystone® Products

9.3 <u>On-site capacity additions</u>.
NetApp will not provide on-site deployment of additional capacity purchased during the subscription term.

9.4 <u>Deployment and Activation of the service to End User.</u>
NetApp will not be responsible for the deployment and configuration of NetApp products delivered as part of the service. The activation of the service for the End User will be the responsibility of the LSC Partner.

9.5 <u>Subscription expiration, cancellation, termination.</u>
NetApp is not responsible for access to, availability, or loss of End User data on Products of this service, after end of subscription term. By end of Subscription Term, End User must:
   a) Discontinue use of XaaS with NetApp Keystone® Services.
   b) Backup, migrate, delete, and/or sanitize media (without rendering media unusable), if and as required by End User.
   c) Notify the LSC Partner that the service 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 the service is not included as part of the service or Fees.
   f) End User may receive an extension of XaaS with NetApp Keystone® 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 via LSC Partner 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.

10. Product Exclusions
XaaS with NetApp Keystone® Products do not include the following items. Additional fees may apply if required to be added.
   a) Cluster switches for exclusive use during commingling or non-Keystone requirements. Cluster switches are included only for initial configuration consisting of more than two Keystone controllers.

b) Racks or PDUs.
c) Network cables and cabling between XaaS with NetApp Keystone® Products and End User's products.
d) SFPs for exclusive use during commingling or for use in End User products.
e) Long-distance SFPs.
f) XaaS with NetApp Keystone® Product modifications, during term, due to change in End User's technical requirements (e.g. protocol, connectivity).

11   Terms and Conditions

11.1   NetApp does not certify Partner capabilities to operate on non-NetApp products.

11.2   If Network switches are procured as a part of ADP or Networking, NetApp supports these switches directly.

11.3   ONTAP features
XaaS with NetApp Keystone® Services provides End User the right to use certain features and services listed in the Service Description. Use of these features and services is subject to the following terms and conditions:
a) All capacity consumption attributable to use of these features counts towards Consumed Capacity.
b) Hardware and software resources consumed through use of these features may affect available capacity and performance.
c) Usage of features are subject to feature specifications and limits.
d) Data Tiering to ONTAP targets:
    i.   Data that are tiered to a NetApp target do not count towards source's Consumed Capacity.
    ii. "NetApp targets" include NetApp's ONTAP or StorageGRID® solutions platforms.
    iii. Tiering non-NetApp targets requires the "Data Tiering to Non-NetApp Targets" Additional Services described in the XaaS with NetApp Keystone® Service Description.

11.4   Reporting
XaaS with NetApp Keystone® Services reporting is limited to NetApp's requirements to deliver the Service and does not provide for End User or Partner specific reporting requirements.

11.5   Site Access
LSC Partner needs to cooperate with NetApp to procure access to site with End User in a timely manner, for purposes including, but not limited to, the following.
a) Subscription Product maintenance, support, including troubleshooting, remediation, and parts replacement.
b) Subscription Product deinstallation and removal.

12.   Performance Service Level Objectives
XaaS with NetApp Keystone® performance service level objective is subject to the following terms and conditions:
a) Degraded performance means the amount of time, in minutes, per incident that 90th percentile latency target is not met.
b) 90th percentile latency is measured per PSLI within a Keystone Order. Latency is sampled every 5 minutes and the 90th percentile value over a 24-hour period is used as the daily measure, considering the following:
    i.   Measurements that are not using at least 5 IOPs at the time of measure will be excluded from sample set
    ii. Greater than 30% writes at the time of measure will be excluded from sample set.
    iii. Latency injected by customer's use of AQoS will be excluded from sample set.
    iv. Latency injected by customer's use of AQoS to maintain absolute minimum IOPs per volume will be excluded from sample set.

     v.   For volumes with FabricPool enabled, latency incurred due to data transfer to/from target (cold) storage will be excluded from sample set.

    vi.   Latency caused by the application, host, or End User network outside of the ONTAP® cluster will be excluded from sample set.

   vii.   When using the Advanced Data Protection Additional Subscription Service, target latency includes only IO to/from local storage array.

  viii.   If there are less than 10 valid measurements during the 24-hour period, then results for this day will be discarded.

c) In FabricPool configurations, Performance Levels apply only if all requested data blocks are residing on FabricPool source (hot) storage and the source storage is not in a SnapMirror® Synchronous relationship.

d) Applicable to NetApp AFF platform only.

e) All per PSLI min/max and other limits apply.

f) All PSLIs must have full and continuous enablement of ASUP

13.   Equipment Move

XaaS with NetApp Keystone® Service provides LSC Partner to move or relocate Subscription Products from initial installation Site to another End User Site, contingent on NetApp approval. Following terms and conditions apply:

a) LSC Partner needs to provide written request to NetApp at least 60 days prior to intended move date.

b) NetApp will investigate and may provide approval and potential additional terms and conditions, based on business, legal, financial, compliance, support, and other considerations.

c) All Subscription Products that were provided per related Order(s) are required to be moved together.

d) All effort, services, or additional hardware required to enable move are not included in XaaS with NetApp Keystone® service pricing.

e) NetApp is not responsible for any service interruption, loss of End User data, providing reporting or Service Levels during move.

f) NetApp is not responsible for backup, migration, encryption, compliance, and securing of End User data during move.

g) LSC Partner is responsible for continuing Minimum Payment and any other payments due, per related Order(s), during and after equipment move.

h) It is recommended that the End User contract NetApp or LSC Partner, if available, to project manage, deinstall, obtain packaging, and package Subscription Products.

i) End User is responsible for shipping, with appropriate replacement value insurance.

j) End User is responsible for loss of or damage to Subscription Products during move and is not covered by NetApp support or warranty.

k) End User is responsible for site preparation at destination Site.

l) LSC Partner is required to deploy service at destination Site, with roles and responsibilities of NetApp, End User, and Partner being same as during initial installation.

11.   Hardware updates

Subscription Hardware updates are based on Hardware end-of-support schedules, amongst other criteria