

NetApp

Keystone® Storage-as-a-Service Service Description

Supplement

1. General

This supplement provides additional features, terms and conditions that apply to the Keystone Storage-as-a-Service Service Description.

2. Customer Responsibilities

2.1 Requirements.

Customer will provide to NetApp relevant Customer Site, technical, workload, operations, and other relevant requirements to help determine proper Keystone STaaS architecture design and STaaS Products prior to shipment.

2.2 Site preparation.

- Facilities
 - Racks and space, per specifications.
 - Redundant, protected power, PDUs, receptacle types and quantities, per specifications.
 - Cooling, per specifications.
 - Moving STaaS Products between shipping/loading area and installation location of facility.
- Network
 - Network cables and cabling required to connect Customer data switches and/or fibre channel switches and hosts to STaaS Products.
 - Network cables and cabling required to connect Customer management switches and hosts to STaaS Products.
 - Network services configuration.
 - SFPs required for Customer equipment.
- Monitoring & management
 - Continuous enablement of full version of NetApp AutoSupport® Monitoring Tool.
 - VMware VMs, on Customer provided management server, for the installation of Keystone® Monitoring Tool.
 - Management network connectivity between management server and management ports of STaaS Products.
 - Internet connectivity for Monitoring Tool to transmit consumption and health data from Monitoring Tool and storage arrays.
 - Remote support and management access to management ports of STaaS Products, via mutually agreed to tool(s), method(s), and times.

2.3 Delayed site readiness charge.

Customer represents and warrants to NetApp® that, on or prior to Target Site Readiness Date, the Site will be prepared and ready for the prompt installation of the STaaS Products. Chronic failure by Customer or any authorized agent, not attributable to NetApp, to ensure and facilitate the prompt installation of any STaaS Products and activation of STaaS Services constitutes a material breach under the Agreement and may incur a charge for such delay.

2.4 Customer owned products.

Customer is responsible for all aspects of Customer owned equipment (NetApp or Non-NetApp), including applicability, compatibility, co- and pre-requisites, design, architecture, additional hardware, and software required, installation, integration, administration, management, support, testing, and documentation.

2.5 Customer specific solutions.

Customer is responsible for all aspects of the solution within which Keystone STaaS will be deployed (e.g., data management, data protection, encryption, monitoring, reporting, security & compliance, ticketing), including applicability, compatibility, co- and pre-requisites, design, architecture, additional hardware, and software required, installation, integration, administration, management, support, testing, and documentation.

2.6 Site access.

Customer is responsible for providing NetApp personnel access to Site, in timely manner, for purposes including, but not limited to the following.

- Site validation.
- STaaS Product inventory, installation, and configuration.
- STaaS Product maintenance, support, including troubleshooting, remediation, and parts replacement.

- STaaS Product deinstallation and removal.

2.7 Use of features and services.

Keystone STaaS provides Customer the right to use certain features and services listed in the Keystone STaaS Service Description. In using these features and services, Customer is responsible for:

- Feature or service applicability, compatibility, co- and pre-requisites, design, architecture, additional hardware and software required, installation, integration, administration, management, support, testing, and documentation.
- Consumption of Committed Capacity and STaaS Product resources resulting from use of the features and services, which may affect capacity and resources available to deliver STaaS Services.

2.8 Administration and operation.

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

- Applying required AQoS policy to each ONTAP® volume.
- Customer specific patch identification and installation and coordination with NetApp KSM.
- ONTAP data SVM configuration.
- Storage Provisioning.
- Equipment moves during subscription term.
- Monitoring and reporting of STaaS Products per Customer specific requirements.

2.9 Modifications and disablement.

Customer may not:

- Modify ONTAP® software version.
- Disable or turn OFF Monitoring Tool or remove NetApp's ability to monitor consumption or health.
- Remove NetApp's access to controller's management ports.
- Disable data efficiencies, including compression, compaction, deduplication, thin provisioning.
- Add, remove, or modify Subscription Hardware.

3. Burst Capacity

Customer may, in its discretion, use the STaaS Services to exceed the Burst Capacity Limit, provided that: (1) NetApp makes no commitment to Customer that there will be capacity available in excess of the Burst Capacity Limit, and (2) NetApp is not responsible for targeting or meeting, and will have no liability with respect to, the Service Levels described during any such time that Customer's use of the STaaS Services exceeds the Burst Capacity Limit. Exceeding the Burst Capacity Limit within any one Performance Level may adversely impact Usable Capacity and available performance of other Performance Levels.

4. Performance levels (On-Premises Service)

The performance characteristics specified in the Keystone STaaS Service Description are subject to the following terms and conditions:

- Supported Protocols
 - ONTAP S3 protocol on File and Block Storage Type is supported only for: 1) FabricPool tiering from ONTAP source to ONTAP target, 2) Keystone approved non-tiering purposes.
- IOPs/TiB
 - File and Block Performance Levels are defined and enabled by AQoS and configuring all Customer volumes with a valid AQoS policy is mandatory.
 - File and Block Performance Levels are based on ONTAP software 9.10+.
 - Each volume is assigned minimum IOPs, per Performance Level, that the storage array will strive to provide to the volume, through AQoS, regardless of size of volume or the amount of data stored in the volume. Minimum IOPs values are determined by NetApp.
 - Target IOPs/Logical TiB allocated per volume, per Performance Level, means the minimum IOPs that the storage array will strive to provide to the volume, through AQoS, assuming 32K block size, Random 70% Read/30% Write IO mix, and IOPs availability.
 - Max IOPs/Logical TiB stored per volume, per Performance Level, means the maximum IOPs that the storage array will permit the volume to deliver, through ONTAP Adaptive QoS, assuming 32K block size, Random 70%/30% read/write IO mix, and IOPs availability.
 - IOPs deployed at Site per Performance Level per Keystone Order equals (Expected IOPs/TiB * 120% Committed Capacity [TiB] * Oversubscription Factor), where Oversubscription Factor is less than or equal to 1 (one) and determined by NetApp® based on NetApp customer base actual utilization by NetApp customers.
 - Actual IOPs/TiB/volume or MBps/TiB/volume may vary and both metrics may not be met simultaneously based on system workload concurrency, block size, IO mix, and features and services in use at the time.

- Non-compliant Volumes: If one or more volumes on a storage array do not have a valid AQoS policy applied, then amount of IOPs available to other volumes may be affected and NetApp will not be responsible for targeting or meeting Performance Levels on that storage array.
- 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.
- Target Latency is measured per volume per Performance Level, for all volumes 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.
 - Measurements of volumes that are not using at least 5 IOPs at the time of measure will be excluded from sample set.
 - Volumes with greater than 30% writes at the time of measure will be excluded from sample set.
 - Latency injected by AQoS (for requested IOPs/TiB that is greater than target IOPs/TiB) will be excluded from sample set.
 - Latency injected by AQoS to maintain minimum IOPs per volume will be excluded from sample set.
 - For volumes with FabricPool enabled, latency incurred due to data transfer to/from target (cold) storage will be excluded from sample set.
 - Latency caused by the application, host, or Customer network outside of the ONTAP® cluster will be excluded from sample set.
 - When using the Advanced Data Protection Additional STaaS Service, target latency includes only IO to/from local storage array.
- All per instance of hardware and software min/max and other limits apply.
- Workload IOPs need to be balanced across all deployed controllers, per Keystone Order.

5. Availability Service Level

Keystone availability service level is subject to the following terms and conditions:

- **Monthly Uptime Percentage** means $[(\text{maximum available minutes in month}) - (\text{average of downtimes of all deployed AFF and FAS storage arrays, per Keystone Order, in month}) / \text{maximum available minutes in month}] \times 100\%$.
- **Maximum Available Minutes** means the total number of minutes in a billing period.
- **Downtime** means the inability of a storage array's controller to service Customer I/O requests, as determined by NetApp, excluding a period when the STaaS Services are not available due to scheduled or mutually agreed upon time for NetApp to perform maintenance, upgrades, or support activities, or due to situations outside of NetApp or Keystone Service control or responsibilities.

6. Sustainability Service Level

Keystone's sustainability Service Level Agreement (SLA) is subject to the following terms and conditions:

- Watts is the power consumed by the ONTAP AFF storage arrays and media shelves and as reported by NetApp AutoSupport® Monitoring Tool.
- Keystone Order requires eligibility approval.
- Capacity (in TiB) is the greater of (1) 120% of Committed Capacity per Performance Level, or (2) the Effective deployed capacity, assuming a data efficiency factor of 2 (two).
- Applicable to standard, non-customized Keystone STaaS, single Performance Level orders, invoiced monthly in arrears.
- Applicable to non-customized, reference Keystone sustainable hardware configurations, consisting of:
 - ONTAP AFF A-Series storage arrays.
 - Two-node switchless cluster.
 - Non-commingled configurations.
 - Non-MetroCluster™ configurations.
- Full version of AutoSupport Monitoring Tool installed and continuously operational on all applicable ONTAP AFF storage arrays.
- Customer data stored must achieve a minimum average data efficiency factor of 2 (two).
- The ambient operating environment temperature, during power consumption measurement, must be between 25°C and 27°C.
- Customer must submit a P1 ticket with Keystone support within 7 days from the service month end.
- NetApp® will make determination of service level breach.
- Customer must provide additional information as requested by NetApp, including Customer's wattage consumption data and method.
- Minimum Committed Capacity per Performance Level must be met.
- Credits will be calculated based on Committed Capacity only.
- Credits can be applied to next month's invoice only.
- Sustainability Service Level

Performance Level	SLA Metric	Min Committed TiB	Eligible Platform
Extreme	< or = 8W/TiB	200 TiB	A800, A900
Premium/Performance	< or = 4W/TiB	300 TiB	A800, A900

- Service Credits

Days SLA Missed in Billing Period	% Monthly Invoice Credit
1 to 2 days	3%
3 to 7 days	15%
14 days	50%

7. ONTAP® features

Keystone STaaS provides Customer the right to use certain features and services listed in the Keystone STaaS Service Description. Use of these features and services is subject to the following terms and conditions:

- All capacity consumption attributable to use of these features counts towards Consumed Capacity.
- Hardware and software resources consumed through use of these features may affect available capacity and performance.
- Usage of features are subject to feature specifications and limits.
- Data Tiering to ONTAP targets:
 - Data that are tiered to a NetApp target do not count towards source’s Consumed Capacity.
 - “NetApp targets” include NetApp’s ONTAP or StorageGRID® solutions platforms.
 - Tiering non-NetApp targets requires the “Data Tiering to Non-NetApp Targets” Additional STaaS Service described in the Keystone STaaS Service Description.

8. Design

Keystone design of STaaS Service architecture excludes Customer specific solution design, application development or integration, process development, third-party software or hardware compatibility checks or integration.

9. STaaS Products

STaaS Products are subject to the following terms and conditions:

- Customer must return STaaS Products to NetApp at the end of the Subscription Term.
- Cluster switches are included only for initial configuration consisting of more than two controllers.
- Cluster switches are not included for exclusive use during commingling or non-Keystone requirements.
- Racks are not included.
- Network cables and cabling between STaaS Products and Customer’s products are not included.
- SFPs are not provided for use in Customer products.

10. Installation

Keystone installation includes the following, if/as applicable:

- Keystone deployment project management.
- Creating configuration workbook per subscription.
- Confirming site preparation.
- Confirming inventory of delivered STaaS Products.
- Installation of STaaS Products into Customer provided racks.
- Inter-STaaS Product cables and cabling.
- Updating Subscription Hardware firmware.
- Updating Subscription Software.
- Installing Subscription Software licenses.
- Configuring disks, spares, RAID.
- Configuring aggregates.
- Configuring switched or switchless cluster.
- Configuring cluster interconnect switches.
- Configuring STaaS Product networking.
- Configuring, enabling, and testing AutoSupport (ASUP).
- Installing and configuring Monitoring Tools on Customer provided VMware VMs.
- Creating applicable AQoS policies in Active IQ Unified Manager.
- Creating minimal test configuration for AQoS policy and host connectivity demo/test (to be deleted after testing).
- Testing and documenting Customer host connectivity (contingent on Customer readiness).
- Testing and documenting controller failover and take-back (contingent on Customer readiness).
- Configuring and testing StorageGRID® systems (if applicable).
- Configuring and testing ASA systems (if applicable).
- Exclusions:

- Installing, configuring, or testing of Customer equipment, servers, clients, VMs, or networks.
- Customer specific solutioning, installation, configuration, or integrating of Customer specific solutions, or applications including, backup/recovery, disaster recovery, data migration, performance assessments, or commingling.
- CVO deployment.

11. Monitoring

Monitoring is limited to NetApp's requirements to deliver Keystone STaaS Services.

12. Dark site

Dark site service limits NetApp's installation of Monitoring Tool and ability to monitor capacity, consumption, health, performance and other system and service metrics as well as ability to remotely access the STaaS Products for troubleshooting and support purposes. Therefore, NetApp's ability to offer and deliver STaaS Services may be limited.

13. Reporting

Keystone service reporting is limited to NetApp's requirements to deliver STaaS Services.

14. Technical support

Keystone technical support is subject to the following exclusions:

- Backup and recovery of the Customer's operating systems, applications, or user data.
- Customer application troubleshooting or performance tuning.
- Identification or removal of viruses or any type of malware.
- Operational testing of Customer specific application, compute, networking, storage, or processes.
- Services required due to Customer's failure to incorporate any system fix, repair, patch, or modification provided by NetApp.
- Services required due to Customer's failure to take avoidance action previously advised by NetApp.
- Services that, in NetApp's opinion, are required due to unauthorized attempts by non-NetApp personnel to install, repair, maintain, or modify hardware, firmware, or software.
- System administration tasks.
- Training.
- Troubleshooting for interconnectivity or compatibility incidents.

15. Software updates

Keystone® software update service is subject to the following exclusions:

- Identification and installation of patches and hotfixes that are uniquely required by the Customer, but not required for operation and delivery of STaaS Services.
- Software updates required to enable and revert from commingling.

16. Hardware updates

Keystone STaaS updates hardware based on STaaS Product end-of-support schedule, amongst other criteria; but does not provide pre-defined hardware "refresh" schedules or commitment.

17. Keystone Success Manager

Keystone Success Manager (KSM) service is subject to the following exclusions:

- KSM scope does not include Customer owned equipment.
- KSM does not replace nor duplicate scope of services provided by NetApp's Support Account Manager ("SAM"; <https://www.netapp.com/services/support/account-manager/>).
- If desired, Customer may separately purchase SAM services for Keystone STaaS Products.

18. Advanced Data Protection

Advanced Data Protection is subject to the following terms and conditions:

- Advanced Data Protection is based on NetApp MetroCluster™.
- Only symmetric MetroCluster configurations are supported.
- Included deployment service.
 - Basic MetroCluster requirements gathering, configuring, and functionality testing.
 - ISL testing and documenting.
 - Creating test aggregate Snap Mirror relationship across sites (to be deleted after testing).

- Testing and documenting node failover and takeback.
- Exclusions
 - Customer specific MetroCluster design.
 - MetroCluster ISL connectivity.
 - MetroCluster peering network switches and connectivity.

19. Data tiering to non-NetApp targets

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

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

20. NR-NVC

NR-NVC is an Additional STaaS Service that allows Customer to retain non-volatile memory components. Following terms and conditions apply:

- Retained components cannot be re-used by Customer.
- NR-NVC is available only at start of a Subscription Term.
- NR-NVC Additional STaaS Service is required to use ONTAP SnapLock® Compliance feature on File and Block Performance Levels.

21. Renewal

- If a new major version of Keystone® STaaS is released during current Subscription Term, then current Keystone Order can be renewed only once and for only one additional year. Thereafter, Keystone Order will be renewed under the terms of then current version.

22. Subscription modifications

- Potential future modifications to STaaS Services need to be communicated to NetApp in timely manner to enable planning, delivery, and deployment of additional STaaS Products, if needed.
- Changes to the Committed Capacities are subject to the increase or decrease increments and minimum Committed Capacity requirements for each applicable Performance Level, as specified in the Keystone STaaS Service Description.
- Committed Capacity Increase: NetApp will provide Customer with confirmation of such increase provided that NetApp will have no obligation to confirm such increase if such increase would require the addition of STaaS 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.
- Committed Capacity Decrease: (i) Customer requests for decreases must be in writing and received by NetApp not less than 60 days prior to the start of the 12-month period for which the adjustment will apply; (ii) no such decrease may reduce the Committed Capacity by an amount greater than 25% of the then-current Committed Capacity, and such decrease will be effective only on the commencement of the subsequent 12-month period; (iii) post-reduction, On-Premises Service monthly Minimum Payment per Keystone Order must be greater than \$16,666 (or US currency equivalent); (iv) the 90 day restriction relating to the addition of STaaS Products described in the Keystone STaaS Service Description applies; (v) any reduction as described the Keystone STaaS Service Description is subject to written NetApp approval.
- Additional STaaS Services: Additional STaaS Service(s) is permitted for Subscriptions with greater than 12 months remaining.
- Reallocation: (i) Customer cannot request reallocation again until after 90 days activation of previous reallocation request; (ii) Customer cannot re-allocate during the last 90 days of the term unless subscription is to be renewed; (iii) Customer's request to reallocate must be submitted at least 5 business days before the next billing cycle and will be activated on the first day of next billing cycle.

23. Equipment move

Keystone STaaS provides Customer to move or relocate STaaS Products from initial installation Site to another Customer Site, contingent on NetApp approval. Following terms and conditions apply:

- Customer needs to provide written request to NetApp at least 60 days prior to intended move date.
- NetApp will investigate and may provide approval and potential additional terms and conditions, based on business, legal, financial, compliance, support, and other considerations.
- All STaaS Products that were provided per related Keystone Order(s) are required to be moved together.
- All effort, services, or additional hardware required to enable move are not included in Keystone service pricing.
- NetApp® is not responsible for any service interruption, loss of customer data, providing reporting or providing Service Levels during move.
- Customer is responsible for backup, migration, encryption, compliance, securing of Customer data during move.

- Customer is responsible for continuing Minimum Payment and any other payments due, per related Keystone® Order(s), during and after move.
- It is recommended that Customer contract NetApp or Partner, if available, to project manage, deinstall, obtain packaging, and package STaaS Products at Site-A.
- Customer is responsible for shipping, with appropriate replacement value insurance.
- Customer is responsible for loss of or damage to STaaS Products during equipment move and is not covered by NetApp support or warranty.
- Customer is responsible for site preparation at destination Site.
- Customer is required to contract NetApp PS or Partner, with Keystone KSM and installation team oversight, to deploy service at destination Site, with roles and responsibilities of NetApp, Customer, and Partner being same as during initial installation.

24. Commingling

Keystone STaaS provides Customer to include STaaS Products and non-Keystone ONTAP® systems within same ONTAP cluster contingent on NetApp approval. Following terms and conditions apply:

- Customer needs request NetApp approval to commingle prior to submission of Keystone Order.
- Allowance is made for the limited purpose of initial data migration only.
- Allowance is for up to a maximum of 90 days following the Start Date.
- The non-Keystone NetApp ONTAP Storage Arrays within the same ONTAP cluster must be covered at the same NetApp support level as Keystone STaaS Products for duration of commingling term.
- 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.