



Service Level Metrics and Definitions

NetApp Keystone

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The following terms and definitions are used within the KFS service:

- **GiB, TiB, and PiB.** Measurements of data storage capacity using base of 1024 (1 GiB = 1024³ bytes, 1 TiB = 1024⁴ bytes, and 1 PiB = 1024⁵ 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):
 - Latency is measured at five-minute intervals for each volume.
 - Over a 24-hour period of five-minute measurements, the highest 10% of latency values are discarded and an average of the remaining results are taken.
 - Latency from the network connection between the storage and the client, or latency introduced by quality of service throttling (as mentioned below) are both excluded from latency calculations.
 - Latency SLA applies to a volume only if the following criteria is met:
 - The average IOPS per volume in an hour is greater than or equal to 100.
 - The percentage of random reads is greater than or equal to 30%; more than 70% write might have higher latency.
 - The average I/O block size is less than or equal to 32 KB.
 - The IOPS/TiB delivered is equal to or less than the greater of the SLA IOPS/TiB allocated or the SLO IOPS/TiB stored.

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