

USING AWS INTELLIGENT TIERING FOR CTERA PORTAL STORAGE

Each object in Amazon S3 has a storage class associated with it. Amazon S3 offers a range of storage classes for the objects that you store. You choose a class depending on your use case scenario and performance access requirements.

The STANDARD storage class is the default storage class if you don't specify a storage class when you upload an object to AWS. However, Amazon also offer a storage class that automatically optimizes frequently and infrequently accessed objects, the INTELLIGENT_TIERING storage class.

The INTELLIGENT_TIERING storage class is designed to optimize storage costs by automatically moving data to the most cost-effective storage access tier, without performance impact or operational overhead.

HOW DOES INTELLIGENT TIERING WORK?

The INTELLIGENT_TIERING storage class is suitable for objects larger than 128 KB that you plan to store for at least 30 days. The storage class stores objects in two access tiers: one tier that is optimized for frequent access and another lower-cost tier that is optimized for infrequently accessed data. Amazon S3 monitors access patterns of the objects in the storage class and moves data on a granular object level that has not been accessed for 30 consecutive days to the infrequent access tier.

With intelligent tiering, you are charged a monthly monitoring and automation fee per object instead of retrieval fees. If an object in the infrequent access tier is accessed, it is automatically moved back to the frequent access tier, but no fees are applied when objects are moved between access tiers within the INTELLIGENT_TIERING storage class.

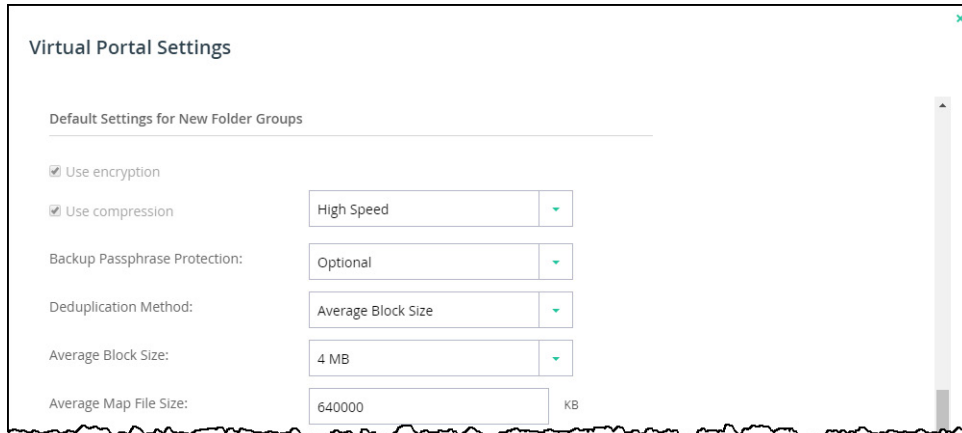
Note: The bigger the block size, the larger the savings. CTERA recommends using the INTELLIGENT_TIERING storage class when the block size is set to 1MB or larger. If the block size is less than 1MB, contact CTERA support to see whether there is a saving.

INTELLIGENT TIERING AND CTERA PORTAL STORAGE

By operating entirely within a customer's virtual private cloud (VPC) on AWS, the CTERA platform delivers the highest levels of data security, privacy, and control. Using the AWS INTELLIGENT_TIERING storage class to store data can save an estimated 20-40% of the typical S3 bill.

The larger the average object size the more negligible is the monitoring and automation fee as part of the whole fee. Whether you use intelligent tiering or not is mainly dependent on the following considerations:

- The average block size of your objects. The INTELLIGENT_TIERING storage class is suitable for objects larger than 128KB. In CTERA Portal files are broken down in to blocks and the block size is controlled by the **Average Block Size** setting in the **Virtual Portal Settings**. The default average block size is 512KB.



Note: CTERA Portal file maps are typically small and are not included in the intelligent tiering transition rule.

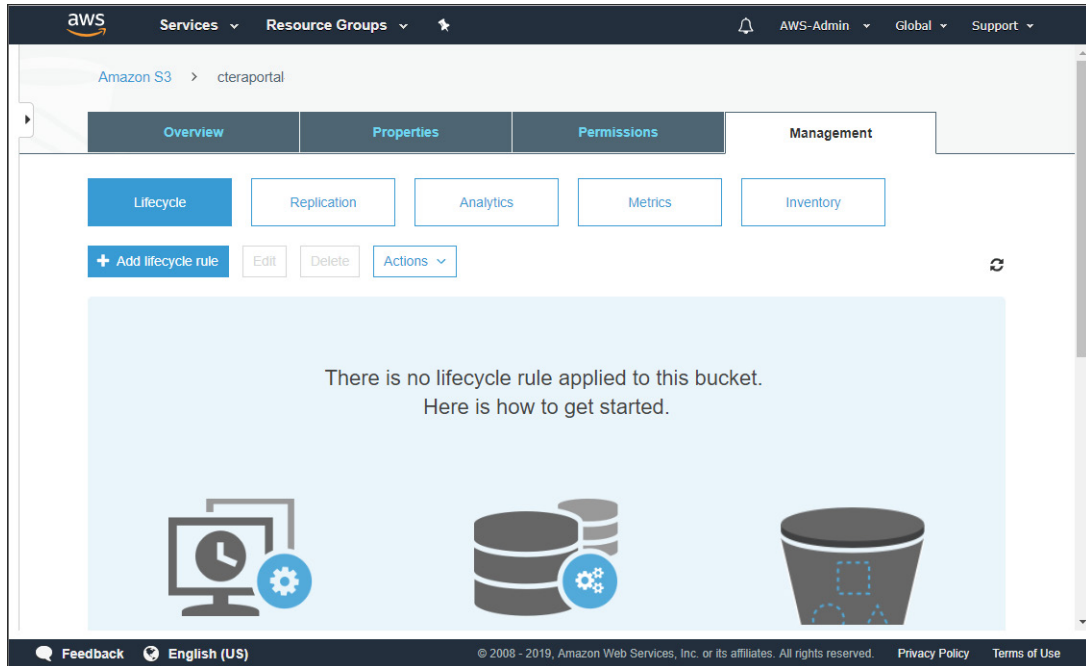
- The percentage of infrequently accessed data.
- The percentage of objects stored for less than 30 days. The INTELLIGENT_TIERING storage class is suitable for objects that you plan to store for at least 30 days and if you delete an object before the end of the 30-day minimum storage duration period, you are charged for 30 days. CTERA Portal retains deleted files for at least 30 days, to enable undeleting a file, meaning that this requirement can be ignored.

CHANGING STORAGE TO INTELLIGENT TIERING

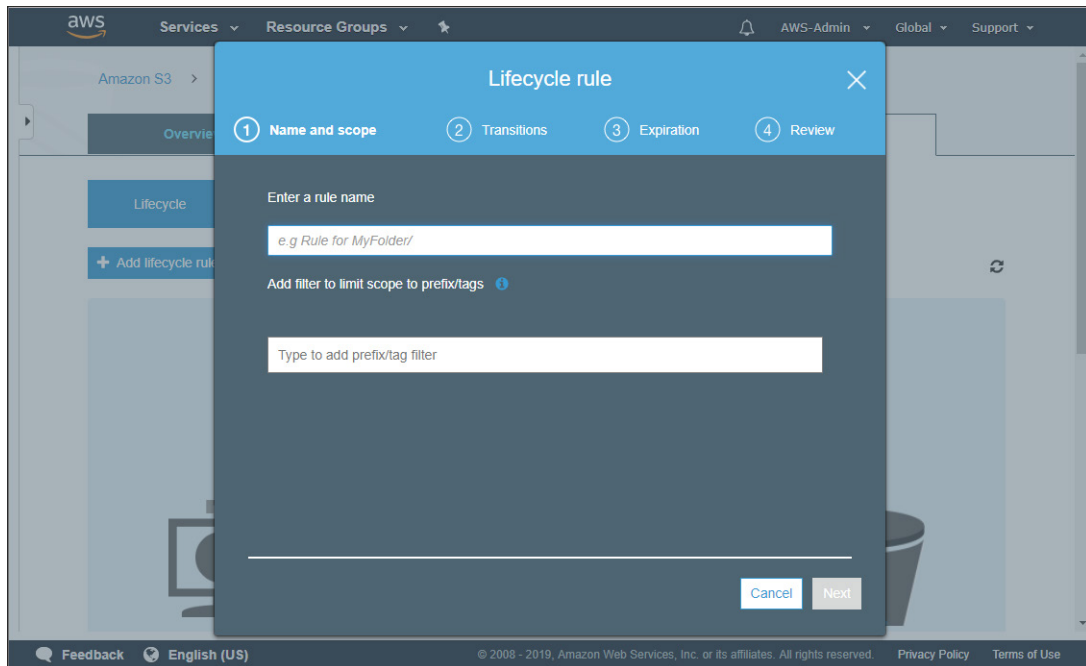
Before transitioning storage to the INTELLIGENT_TIERING storage class, CTERA recommends checking the average size of the objects being stored and the days they are held in storage.

To transition storage to intelligent tiering storage:

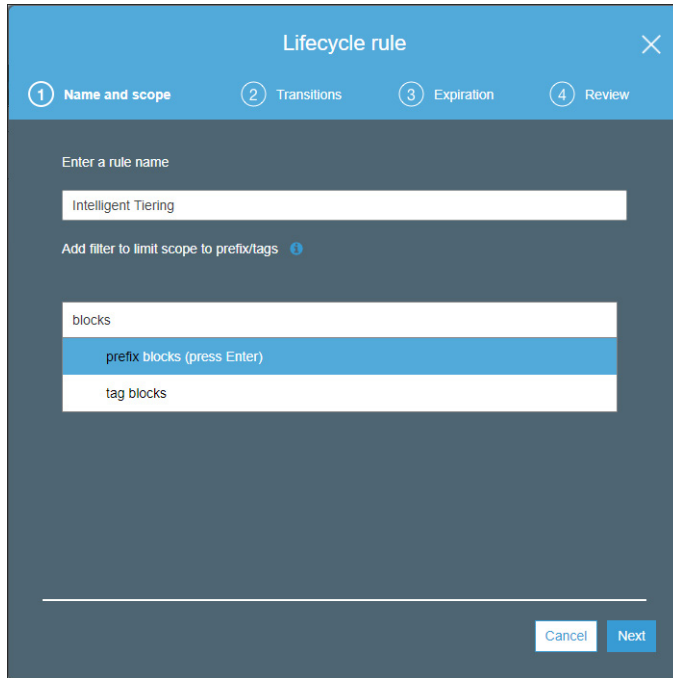
- 1** From your Amazon Web Services account, sign in to the AWS Management Console and select **Services**.
- 2** Under **Storage**, select **S3**.
- 3** Click the CTERA Portal bucket from the S3 buckets list and then select the **Management** tab. The management details for the bucket are displayed.



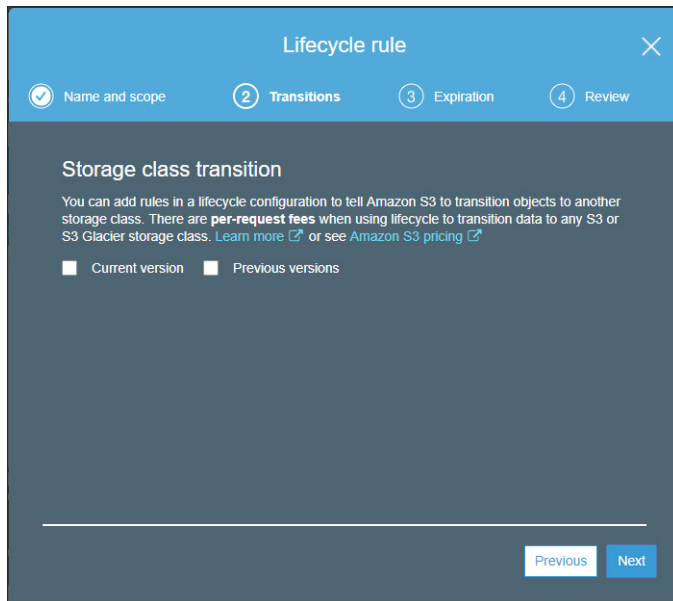
- 4 Click **Add lifecycle rule**.
The **Lifecycle rule wizard** is displayed.



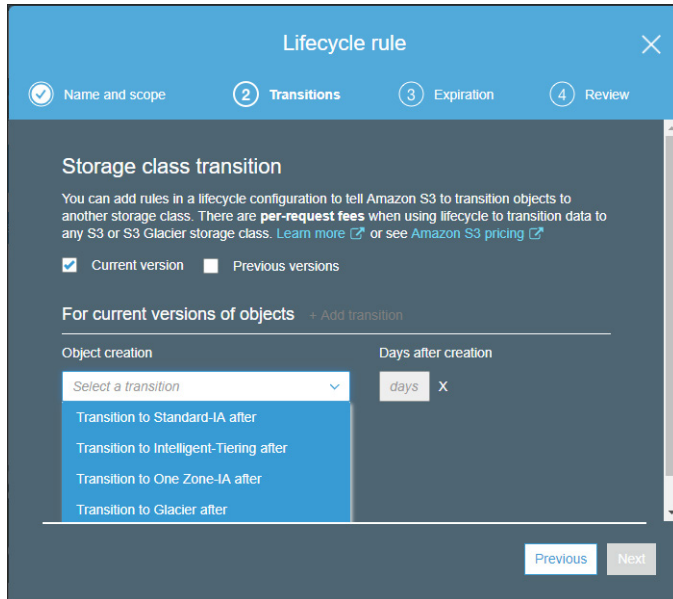
- 5 Enter a name for the rule and in the filter text box enter `blocks` and the press **Enter**.



- 6 Click **Next**.
The **Lifecycle rule** wizard **Transitions** screen is displayed.



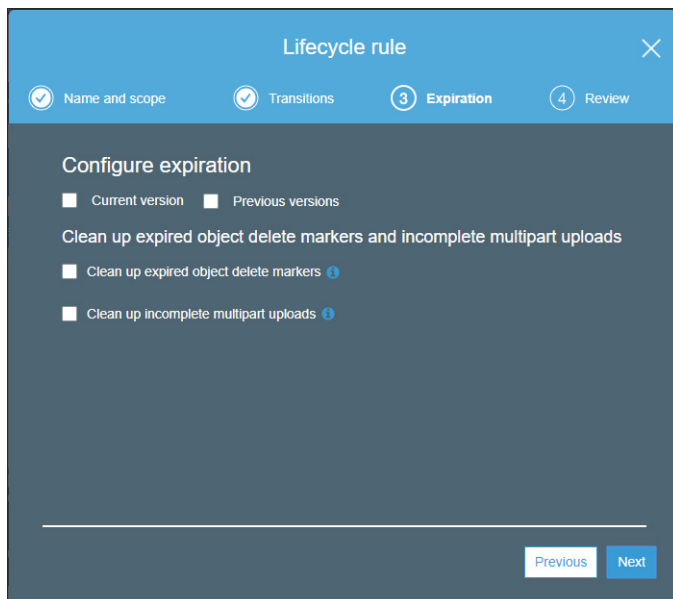
- 7 Check **Current version**.
The **Transitions** screen is changed to include the ability to add transitions.
- 8 Click **Add transition** and from the **Object creation** drop-down select **Transition to Intelligent-Tiering after**.



9 Specify 7 days to wait until the transition is performed.

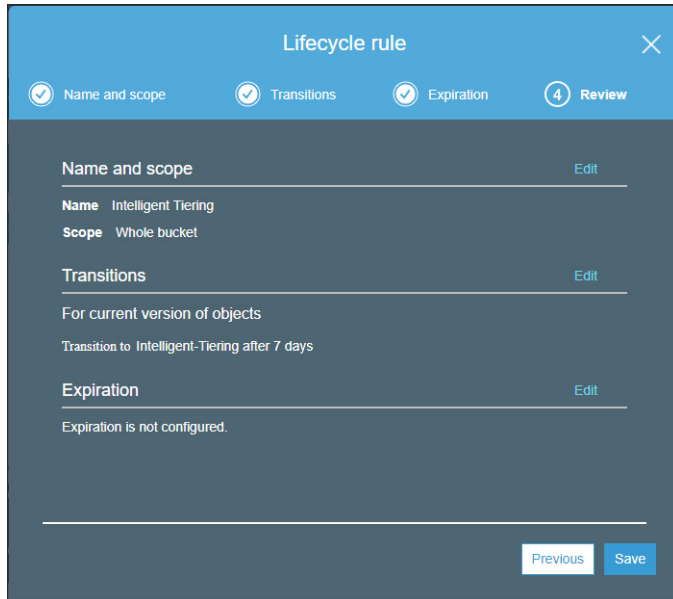
10 Click **Next**.

The **Lifecycle rule** wizard **Expirations** screen is displayed.



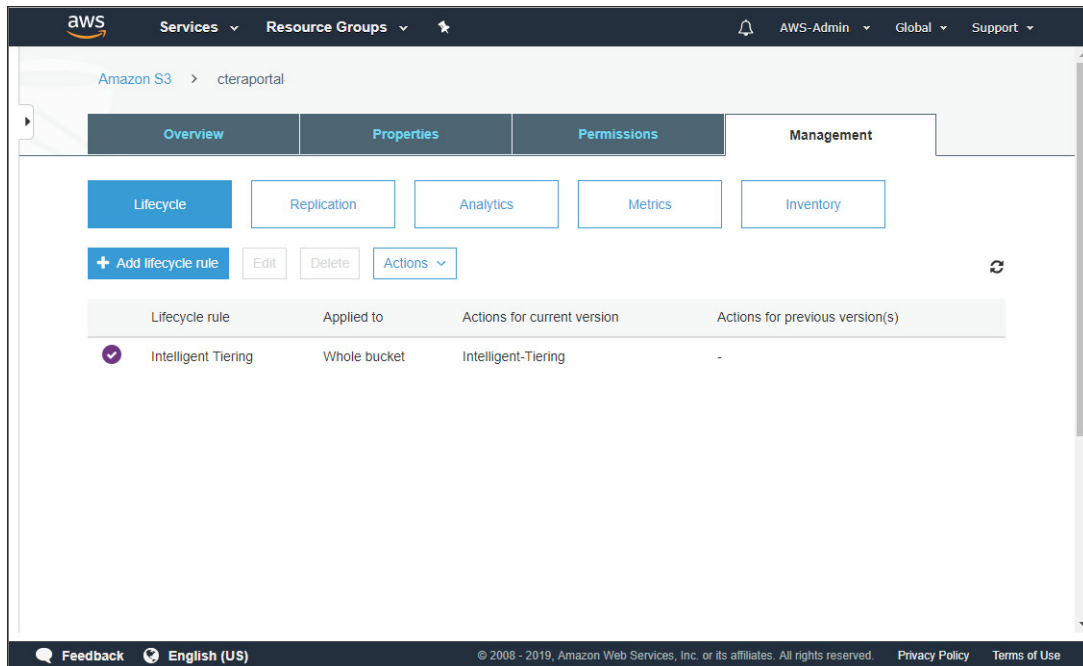
11 Leave the defaults, everything unchecked, and click **Next**.

The **Lifecycle rule** wizard **Review** screen is displayed.



12 Click **Save**.

The management details for the bucket are displayed showing the added lifecycle rule.

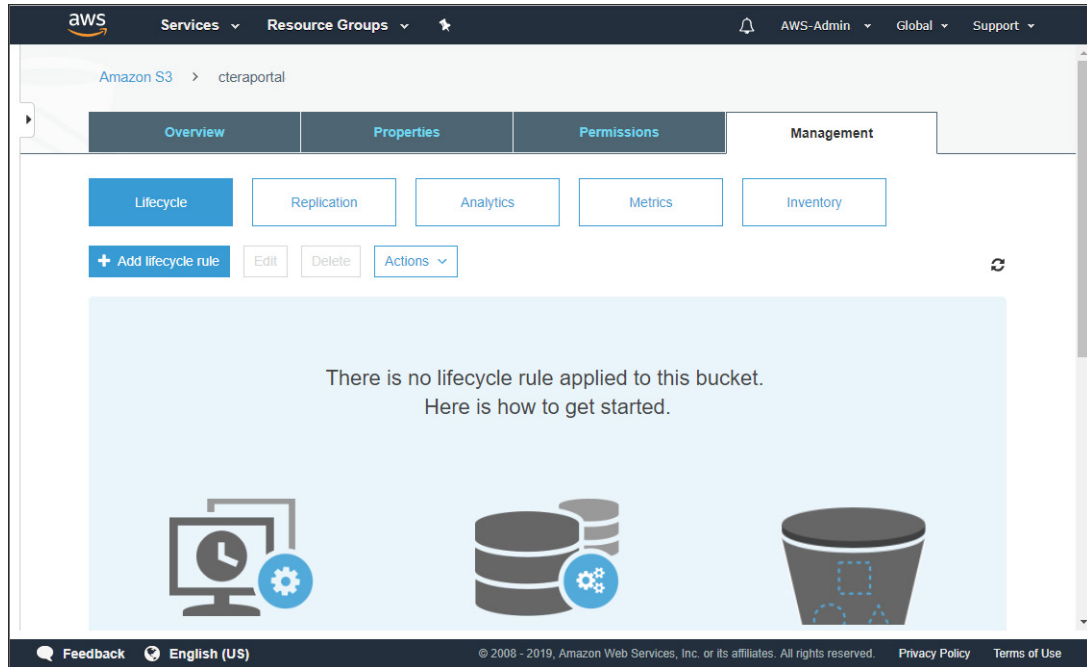


Use management metrics to validate the storage transition.

To access management metrics for an S3 bucket:

- 1** From your Amazon Web Services account, sign in to the AWS Management Console and select **Services**.
- 2** Under **Storage**, select **S3**.
- 3** Click the CTERA Portal bucket from the S3 buckets list and then select the **Management** tab.

The management details for the bucket are displayed.



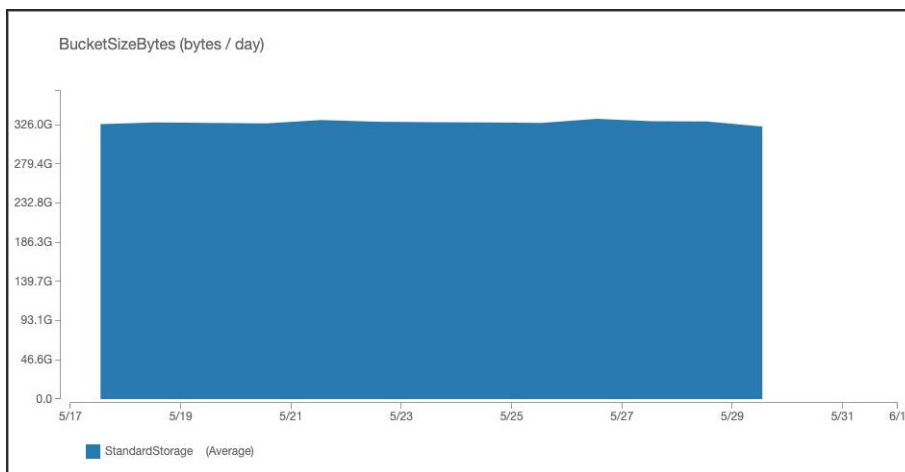
4 Click **Metrics**.

The metrics for the bucket are displayed. Graphs are displayed after transitioning to the INTELLIGENT_TIERING storage class.

Example

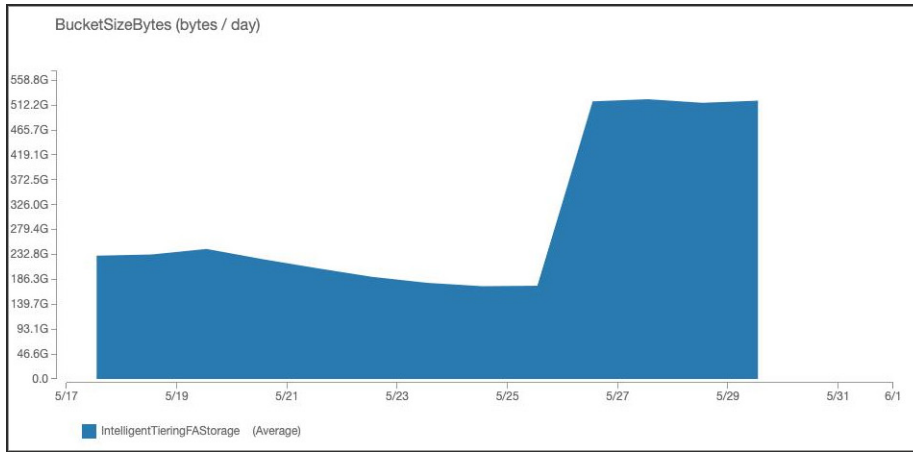
Standard storage:

The following graph shows that approximately 323GB is stored in standard storage.



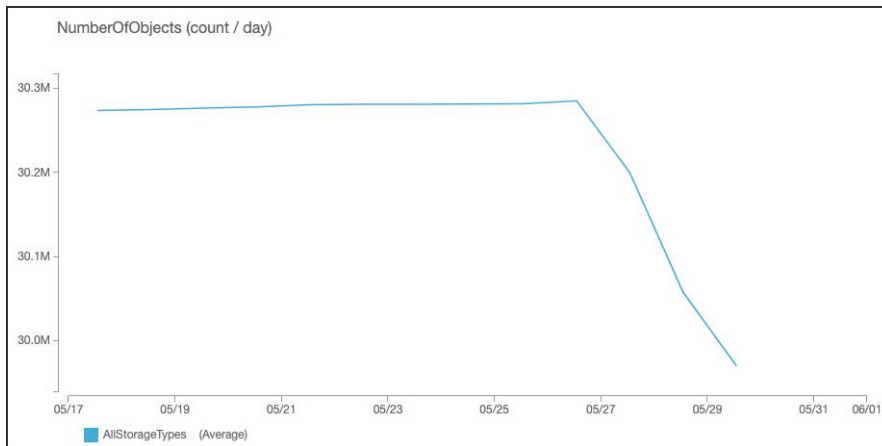
Intelligent tiering, frequently accessed storage:

The following graph shows the frequently accessed storage in intelligent storage over the same period.



Number of objects:

The following graph shows that there are around 30.3 million objects in the storage going down to under 30 million objects.



Thus, in this example, out of a total of approximately 31TB storage configured with an average of 4MB block size, 1% (323GB) remains in standard storage, the majority (97.4%) (30.2TB) is stored in the cheaper infrequently accessed storage and the other 1.6% (500GB) in frequently accessed storage. The costs for the PUT and GET requests for both the INTELLIGENT_TIERING storage class and the STANDARD storage class are the same. Using these figures to calculate the cost when using the INTELLIGENT_TIERING storage class instead of the STANDARD storage class using the pricing from

<https://aws.amazon.com/s3/pricing/> with the US East (N. Virginia) pricing provides the following monthly saving.

AWS Charges	INTELLIGENT_TIERING	STANDARD
Monthly storage	\$396	\$713
Monitoring and automation ^a	\$75 (\$0.0025 per 1000 objects*30,000)	—
Total monthly cost	\$471	\$713
Total monthly saving	\$242	—

- a. In reality, of the 30 million objects, only a percentage will use the INTELLIGENT_TIERING storage class, so the cost for monitoring and automation will be less than \$75.