### ****Observations and Proposals****

### ****Current Backup Schedule Overview****

* **Daily Backups**: In all Landing Zone accounts Backups are currently running every day, including weekends.
* **Duplicate Saturday Jobs**: On Saturdays, the same backup jobs are running twice, leading to unnecessary duplication.
* **Impact:** Running backups every day, especially on weekends when operational changes are minimal, may lead to unnecessary consumption of storage and compute resources. The duplication of jobs on Saturdays increases storage usage and potentially leads to higher costs.

### ****Proposed New Schedule****

* **Weekday Schedule**: Daily backups from Monday to Friday.
* **Weekend Schedule**: Single backup job on Saturday or Sunday, depending on business requirements.
* **Saturday Duplicates**: Ensure only one backup job runs on Saturday, eliminating duplicates.
* **Expected Cost Savings**: potential cost savings by reducing storage usage and eliminating duplicate jobs.

### ****Retention Strategy****

#### ****Current Retention Period****

* **Retention Period**: 35 days.
* **Storage Class**: All backups are currently stored in standard S3 storage.

#### ****Proposed Retention Period****

* **Initial Storage (5 Days)**:
  + Backups will be stored in standard S3 storage for the first 5 days. This ensures quick access for recent data recovery needs.
* **Long-Term Storage (30 Days)**:
  + After 5 days, backups will be automatically moved to S3 Glacier instance storage class, where they will be stored for the remaining 30 days. Glacier is a cost-effective solution for long-term storage of data that is infrequently accessed.

#### ****Benefits of the Proposed Strategy****

* **Cost Efficiency**: S3 Glacier offers significantly lower storage costs compared to standard S3. By moving backups to Glacier after 5 days, you can achieve substantial cost savings while still retaining necessary backups.
* **Data Durability**: S3 Glacier provides the same high durability as S3, ensuring that your data is secure even in long-term storage.
* **Optimized Access**: The first 5 days in standard S3 allows for rapid data retrieval when it's most likely needed. After this period, moving to Glacier balances cost with access needs for older data.

#### ****Overview of S3 Glacier Storage Classes****

Amazon S3 offers multiple Glacier storage classes designed for different archival needs. Below is a summary of each:

**S3 Glacier Instant Retrieval**:

* 1. **Storage Cost**: $0.004 per GB per month.
  2. **Retrieval Time**: Milliseconds.
  3. **Use Case**: Ideal for data that is infrequently accessed but requires quick retrieval when needed, such as backups and compliance archives.

**S3 Glacier Flexible Retrieval**:

* 1. **Storage Cost**: $0.0036 per GB per month.
  2. **Retrieval Time**:
     1. **Standard**: 3–5 hours.
     2. **Bulk**: 5–12 hours.
     3. **Expedited**: 1–5 minutes.
  3. **Use Case**: Suitable for data that is rarely accessed and can tolerate slower retrieval times. Best for long-term archives where cost is prioritized over speed.

**S3 Glacier Deep Archive**:

* 1. **Storage Cost**: $0.00099 per GB per month.
  2. **Retrieval Time**:
     1. **Standard**: 12 hours.
     2. **Bulk**: Up to 48 hours.
  3. **Use Case**: Designed for data that is rarely, if ever, accessed but must be retained for regulatory or compliance reasons. This is the most cost-effective option for long-term archiving.

#### ****Current Backup Strategy****

* **Storage Class**: Standard S3.
* **Retention Period**: 35 days.
* **Cost Implications**: While standard S3 provides rapid access, the cost associated with storing data for 35 days is relatively high.

#### ****Proposed Backup Strategy****

* **Initial 5 Days in S3 Standard**:
  + Retain the current practice of storing backups in S3 Standard for the first 5 days, ensuring immediate access to recent data.
* **Transition to S3 Glacier Instant Retrieval for the Remaining 30 Days**:
  + After 5 days, transition backups to S3 Glacier Instant Retrieval. This approach offers a significant reduction in storage costs while maintaining millisecond retrieval times for critical data.

#### ****Benefits of S3 Glacier Instant Retrieval****

* **Cost Efficiency**:
  + With a storage cost of $0.004 per GB per month, S3 Glacier Instant Retrieval is considerably cheaper than standard S3, leading to substantial savings.
* **Rapid Access**:
  + Retrieval times in the milliseconds ensure that backups are readily available when needed, closely matching the access speed of standard S3.
* **Balance of Cost and Performance**:
  + S3 Glacier Instant Retrieval is specifically designed for scenarios where data needs to be accessible quickly but is not frequently retrieved, making it a perfect fit for our backup strategy.

#### ****Cost Savings Analysis****

* **Storage Costs**:
  + By using S3 Glacier Instant Retrieval for 30 out of the 35 days, we can achieve significant cost savings. For example, for 1 TB of data:
    - **S3 Standard (35 days)**: $23.00 per month.
    - **S3 Standard (5 days) + Glacier Instant Retrieval (30 days)**: $6.96 per month.
    - **Total Savings**: Approximately 70% reduction in storage costs.

#### ****Conclusion and Final Recommendation****

After evaluating the available S3 Glacier storage classes, S3 Glacier Instant Retrieval emerges as the most suitable option for our needs. It offers a balance between cost-effectiveness and fast retrieval times, making it an ideal choice for our backup storage. I recommend adopting this strategy to optimize costs while ensuring that critical backups remain accessible within milliseconds when needed.