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Recommendations in AWS

**Recommendations APIs in AWS Cloud**

**Recommendations APIs:**

**Introduction:** Recommendations APIs in AWS Cloud are mainly generated by three services that will be used for various functions like Get, Delete, Describe, and Export. These recommendations are mainly generated by using the following three services in AWS Cloud.

* AWS Cost Explorer
* AWS Compute-Optimizer
* Amazon Sage-Maker

These recommendations APIs are used for various purposes. Here we are mainly concentrating on Cost-Optimization which reduces the cloud operational costs by 25%-50%. Apart from these all-recommendations APIs, we are going to apply five recommendations that are related to cost optimization. Here we as a team going to apply these recommendations for cost optimization in an Automated way by generating pull requests and the recommendations are going to be applied automatically once the reviewer approved. Below are the recommended APIs that are categorized.

**AWS Cost-Explorer:**

1. **Rightsizing Recommendations:**
2. **API Direct link:** [GetRightSizingRecommendation](https://docs.aws.amazon.com/aws-cost-management/latest/APIReference/API_GetRightsizingRecommendation.html)
3. **Description:** Rightsizing Recommendations API is used to get the recommendations for idle or unused EC2 instances. The recommendations provided by the AWS Service are called AWS Cost-Explorer. And also create recommendations that help you save costs by identifying idle and underutilized Amazon EC2 instances. Recommendations are generated to either downsize or terminate instances, along with providing savings detail and metrics.
4. **Estimated cost savings:** By using the Rightsizing Recommendation API the estimated savings for the cloud costs will be reduced by 50%.
5. **ReservationPurchase Recommendations:**
6. **API Direct link:** [GetReservationPurchaseRecommendation](https://docs.aws.amazon.com/aws-cost-management/latest/APIReference/API_GetReservationPurchaseRecommendation.html)
7. **Description:** Gets recommendations for reservation purchases. These recommendations might help you to reduce your costs. Reservations provide a discounted hourly rate (up to 75%) compared to On-Demand pricing. AWS generates your recommendations by identifying your On-Demand usage during a specific time period and collecting your usage into categories that are eligible for a reservation. After AWS has these categories, it simulates every combination of reservations in each category of usage to identify the best number of each type of Reserved Instance (RI) to purchase to maximize your estimated savings.
8. **Estimated Cost savings:** By using the ReservationPurchase Recommendations API the estimated savings for the cloud costs will be reduced by 75%.
9. **SavingsPlansPurchase Recommendations:**
10. **API Direct link:** [GetSavingsPlansPurchaseRecommendation](https://docs.aws.amazon.com/aws-cost-management/latest/APIReference/API_GetSavingsPlansPurchaseRecommendation.html)
11. **Description:** Retrieves your request parameters, Savings Plan Recommendations Summary, and Details.

**AWS Compute-Optimizer:**

1. **EC2 Instance Recommendations:**
2. **API Direct link:** [GetEC2InstanceRecommendations](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_GetEC2InstanceRecommendations.html)
3. **Description:** EC2 Instance Recommendations API is used to get the recommendations for idle or unused EC2 instances. The recommendations are provided by the AWS Service called Compute-Optimizer. And returns Amazon EC2 instance recommendations. AWS Compute Optimizer generates recommendations for Amazon Elastic Compute Cloud (Amazon EC2) instances that meet a specific set of requirements.
4. **Estimated cost savings:** By using the EC2 Instance Recommendation API the estimated savings for the cloud costs will be reduced by 25%.
5. **EBS Volume Recommendations:**
6. **API Direct link:** [GetEBSVolumeRecommendations](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_GetEBSVolumeRecommendations.html)
7. **Description:** EBS Volume Recommendations API is used to get the recommendations for idle or unused EBS Volumes. The recommendations are provided by the AWS Service called Compute-Optimizer. And also returns Amazon Elastic Block Store (Amazon EBS) volume recommendations. AWS Compute Optimizer generates recommendations for Amazon EBS volumes that meet a specific set of requirements.
8. **Estimated cost savings:** By using the EBS Volume Recommendation API the estimated savings for the cloud costs will be reduced by 25%.
9. **AutoscalingGroup Recommendations:**
10. **API Direct link:** [GetAutoScalingGroupRecommendations](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_GetAutoScalingGroupRecommendations.html)
11. **Description:** Autoscaling Group Recommendations API is used to get the recommendations for idle or unused Autoscaling Groups. The recommendations are provided by the AWS Service called Compute-Optimizer. And returns Auto Scaling group recommendations. AWS Compute Optimizer generates recommendations for Amazon EC2 Auto Scaling groups that meet a specific set of requirements.
12. **Estimated cost savings:** By using the EC2 Autoscaling Group Recommendation API the estimated savings for the cloud costs will be reduced by 25%.
13. **LambdaFunction Recommendations:**
14. **API Direct link:** [GetLambdaFunctionRecommendations](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_GetLambdaFunctionRecommendations.html)
15. **Description:** Lambda Function Recommendations API is used to get the recommendations for idle or unused Lambda Functions. The recommendations are provided by the AWS Service called Compute-Optimizer. And returns AWS Lambda function recommendations. AWS Compute Optimizer generates recommendations for functions that meet a specific set of requirements.
16. **Estimated cost savings:** By using the Lambda Function Recommendation API the estimated savings for the cloud costs will be reduced by 25%.
17. **DeleteRecommendationPreferences:**
18. **API Direct link:** [DeleteRecommendationPreferences](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_DeleteRecommendationPreferences.html)
19. **Description:** Deletes a recommendation preference, such as enhanced infrastructure metrics.
20. **DescribeRecommendationExportJobs:**
21. **API Direct link:** [DescribeRecommendationExportJobs](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_DescribeRecommendationExportJobs.html)
22. **Description:** Describes recommendation export jobs created in the last seven days.
23. **ExportAutoScalingGroupRecommendations:**
24. **API Direct link:** [ExportAutoScalingGroupRecommendations](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_ExportAutoScalingGroupRecommendations.html)
25. **Description:** Exports optimization recommendations for Auto Scaling groups. Recommendations are exported in a comma-separated values (.csv) file, and its metadata in a JavaScript Object Notation (JSON) (.json) file, to an existing Amazon Simple Storage Service (Amazon S3) bucket that you specify. You can have only one Auto Scaling group export job in progress per AWS Region.

# ExportEBSVolumeRecommendations:

1. **API Direct link:** [ExportEBSVolumeRecommendations](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_ExportEBSVolumeRecommendations.html)
2. **Description:** Exports optimization recommendations for Amazon EBS Volumes. Recommendations are exported in a comma-separated values (.csv) file, and its metadata in a JavaScript Object Notation (JSON) (.json) file, to an existing Amazon Simple Storage Service (Amazon S3) bucket that you specify. You can have only one Auto Scaling group export job in progress per AWS Region.

# ExportEC2InstanceRecommendations:

1. **API Direct link:** [ExportEC2InstanceRecommendations](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_ExportEC2InstanceRecommendations.html)
2. **Description:** Exports optimization recommendations for Amazon EC2 Instances. Recommendations are exported in a comma-separated values (.csv) file, and its metadata in a JavaScript Object Notation (JSON) (.json) file, to an existing Amazon Simple Storage Service (Amazon S3) bucket that you specify. You can have only one Auto Scaling group export job in progress per AWS Region.

# ExportLambdaFunctionRecommendations:

1. **API Direct link:** [ExportLambdaFunctionRecommendations](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_ExportLambdaFunctionRecommendations.html)
2. **Description:** Exports optimization recommendations for AWS Lambda Functions. Recommendations are exported in a comma-separated values (.csv) file, and its metadata in a JavaScript Object Notation (JSON) (.json) file, to an existing Amazon Simple Storage Service (Amazon S3) bucket that you specify. You can have only one Auto Scaling group export job in progress per AWS Region.

# GetEC2RecommendationProjectedMetrics:

1. **API Direct link:** [GetEC2RecommendationProjectedMetrics](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_GetEC2RecommendationProjectedMetrics.html)
2. **Description:** Returns the projected utilization metrics of Amazon EC2 instance recommendations.

# GetEffectiveRecommendationPreferences:

1. **API Direct link:** [GetEffectiveRecommendationPreferences](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_GetEffectiveRecommendationPreferences.html)
2. **Description:** Returns the recommendation preferences that are in effect for a given resource, such as enhanced infrastructure metrics. Considers all applicable preferences that you might have set at the resource, account, and organization level. When you create a recommendation preference, you can set its status to Active or Inactive. Use this action to view the recommendation preferences that are in effect, or Active.

# GetRecommendationPreferences:

1. **API Direct link:** [GetRecommendationPreferences](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_GetRecommendationPreferences.html)
2. **Description:** Returns existing recommendation preferences, such as enhanced infrastructure metrics. Use the scope parameter to specify which preferences to return. You can specify to return preferences for an organization, a specific account ID, or a specific EC2 instance or Auto Scaling group Amazon Resource Name (ARN).

# GetRecommendationSummaries:

1. **API Direct link:** [GetRecommendationSummaries](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_GetRecommendationSummaries.html)
2. **Description:** Returns the optimization findings for an account. It returns the number of:

* Amazon EC2 instances in an account that are Underprovisioned, Overprovisioned, or Optimized.
* Auto Scaling groups in an account that are NotOptimized, or Optimized.
* Amazon EBS volumes in an account that are NotOptimized, or Optimized.
* Lambda functions in an account that are NotOptimized, or Optimized.

**Amazon Sage-Maker:**

# PutRecommendationPreferences:

1. **API Direct link:** [PutRecommendationPreferences](https://docs.aws.amazon.com/compute-optimizer/latest/APIReference/API_PutRecommendationPreferences.html)
2. **Description:** Creates a new recommendation preference or updates an existing recommendation preference, such as enhanced infrastructure metrics.

# CreateInferenceRecommendationsJob:

1. **API Direct link:** [CreateInferenceRecommendationsJob](https://docs.aws.amazon.com/sagemaker/latest/APIReference/API_CreateInferenceRecommendationsJob.html)
2. **Description:** Starts a recommendation job. You can create either an instance recommendation or load test job.

# DescribeInferenceRecommendationsJob:

1. **API Direct link:** [DescribeInferenceRecommendationsJob](https://docs.aws.amazon.com/sagemaker/latest/APIReference/API_DescribeInferenceRecommendationsJob.html)
2. **Description:** Provides the results of the Inference Recommender job. One or more recommendation jobs are returned.

# ListInferenceRecommendationsJobs:

1. **API Direct link:** [ListInferenceRecommendationsJobs](https://docs.aws.amazon.com/sagemaker/latest/APIReference/API_ListInferenceRecommendationsJobs.html)
2. **Description:** Provides the results of the Inference Recommender job. One or more recommendation jobs are returned

# StopInferenceRecommendationsJob:

1. **API Direct link:** [StopInferenceRecommendationsJob](https://docs.aws.amazon.com/sagemaker/latest/APIReference/API_StopInferenceRecommendationsJob.html)
2. **Description:** Stops an Inference Recommender job.

**Conclusion:** According to all above mentioned 22 recommendations are the most likely to perform various functions and some of them are used to reduce the cost. As per our requirement we mainly concentrated o cost-optimization for compute instances. We mainly focused on the following recommendation APIs which will reduce the cloud operational costs by applying them.

1. AWS Cost Explorer

* Rightsizing Recommendations

1. AWS Compute-Optimizer

* EC2 Instance Recommendations
* EBS Volume Recommendations
* EC2 Auto-scaling groups Recommendations
* Lambda Functions Recommendations

The same procedure for remaining recommendations will be applicable and can modify and apply them as per the requirements.