

Cost Optimization Playbook

AWS
Technical Account Manager 박양수



사전 확인 사항

1. CUR

<https://docs.aws.amazon.com/cur/latest/userguide/what-is-cur.html>

The screenshot shows the AWS Cost and Usage Reports interface. On the left, there's a sidebar with links like Home, Cost Management, Cost Explorer, Budgets, Budgets Reports, Savings Plans, and Cost & Usage Reports. The main area is titled "AWS Cost and Usage Reports" and contains a table with columns: Report name, S3 bucket, Time granularity, and Data last refreshed. A row is selected for "CUR" with values "curforshpapa", "Hourly", and "08/18/2020, 7:15 AM". At the top of this section are buttons for Create report, Edit, and Delete.

2. RI/SP Sharing

<https://docs.aws.amazon.com/awsaccountbilling/latest/aboutv2/ri-turn-off.html>

The screenshot shows the "Billing preferences" section of the AWS Billing Preferences page. The sidebar includes links for Home, Cost Management, Cost Explorer, Budgets, Budgets Reports, Savings Plans, Cost & Usage Reports, Cost Categories, Cost allocation tags, Billing, Bills, Orders and invoices, Credits, Purchase orders (preview), Preferences, Billing preferences (which is selected), Payment methods, Consolidated billing, and Tax settings. The main content area is titled "Preferences" and has a section for "Billing Preferences". It includes options for "Receive PDF Invoice By Email" and "Disable credit sharing". Below this is a section for "RI and Savings Plans discount sharing" with a note about it controlling both RI and Savings Plans discounts. It shows two states: "RI and Savings Plans discount sharing enabled" (left) and "RI and Savings Plans discount sharing disabled" (right). Each state has a list of accounts and buttons for "Add to list" and "Remove from list".



사전 확인 사항

3. Cost Allocation Tags

<https://docs.aws.amazon.com/awsaccountbilling/latest/aboutv2/cost-alloc-tags.html>

The screenshot shows the 'Cost Allocation Tags' page in the AWS Cost Management console. On the left, a sidebar lists navigation options: Home, Cost Management (selected), Cost Explorer, Budgets, Budgets Reports, Savings Plans, Cost & Usage Reports, Cost Categories, and Cost allocation tags (selected). The main content area is titled 'User-Defined Cost Allocation Tags' and includes a note that tags are finished loading. It explains that activating tags allows AWS to make cost data available throughout the billing pipeline and can be used as a filtering and grouping dimension. A note also states that certain tagged resources (like accounts) are not billable and won't flow through the pipeline even if activated. Below this, a note says clicking Refresh prioritizes account updates. At the top right are 'Activate', 'Deactivate', 'Undo', and 'Refresh' buttons. The bottom features a search bar, a filter dropdown set to 'All tags', and a 'Tags per page' dropdown set to 100. A table lists two tags: 'tagkey*' and 'tagtest', both of which are active.

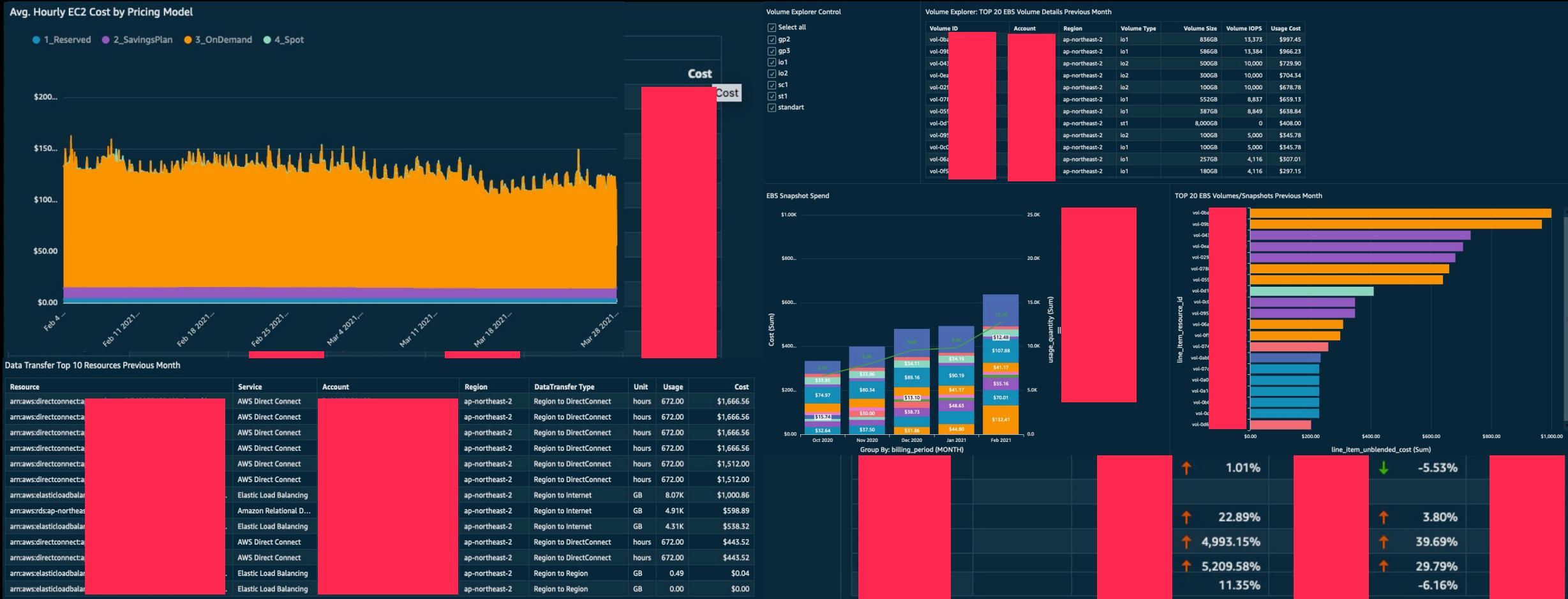
Tag key*	Status
tagkey*	Active
tagtest	Active



사전 확인 사항

4. CUDOS(optional)

<https://cudos.workshop.aws/intro.html>



Clean up

1. Trust Advisor 를 통해 미사용 EIP 확인 후 삭제

The screenshot shows a report titled "Unassociated Elastic IP Addresses". It includes a warning icon and a detailed description of what the report checks for: "Checks for Elastic IP addresses (EIPs) that are not associated with a running Amazon Elastic Compute Cloud (Amazon EC2) instance. EIPs are static IP addresses designed for dynamic cloud computing. Unlike traditional static IP addresses, EIPs can mask the failure of an instance or Availability Zone by remapping a public IP address to another instance in your account. A nominal charge is imposed for an EIP that is not associated with a running instance." The report was refreshed a minute ago.

2. Console에서 미사용 EBS 확인 후 삭제

The screenshot shows the AWS EBS console. On the left, there's a list of volumes with one entry: "unused" (Volume ID: vol-0fe4c96b...). In the center, a modal window titled "Actions" is open, showing options like "Modify Volume", "Create Snapshot", "Delete Volume", etc. The "Delete Volume" option is highlighted in yellow. On the right, a table lists volumes. One volume in the table has its "State" column highlighted with a red box, showing it is "available". The AWS logo is visible in the bottom right corner.

Clean up

3. 그 밖의 미사용 resources(EC2, RDS 등) 중지 후 삭제

- CPU (혹은 Disk I/O) 사용률이 없는(ex. Max CPU <= 1%) resource에 대해 담당자 확인 후 중지 (SSD type 인스턴스(ex. i3.large)는 중지 시 Local Storage에 있는 데이터는 삭제됨을 고려해야함)
- 일정 기간 이후 삭제(필요시 Snapshot 생성 이후 삭제)



Right Sizing

Rightsizing recommendations

Rightsizing recommendations [Info](#)

Rightsizing recommendations review your historical Amazon EC2 usage for the past 14 days to identify opportunities for greater cost and usage efficiency.

Recommendation parameters

Display recommendations

- Within the same instance family
- Across instance families

Finding types

- Idle instances
- Underutilized instances

Advanced options

- Include Savings Plans and Reserved Instances

Recommendations

Optimization opportunities

Estimated monthly savings

Estimated savings (%)

[Download CSV](#)

Amazon EC2 console [\[View\]](#)

Compute Optimizer

AWS Mettle > Dashboard > EC2 Instance recommendations > Recommendation detail: Portal1_DEV

Recommendation detail: Portal1_DEV [Info](#)

[View in EC2 console](#) [Export](#)

Configuration comparison and selection [Info](#)

Select one of the recommended options to compare it against your current utilization metrics below.

Configuration	Instance type	On-Demand price	Price difference	Risk level	vCPUs	Memory	Storage	Ne
Current (Portal2_P)	m5.2xlarge	\$0.384 per hour			8	32GiB	EBS Only	Up
Option 1	m5.xlarge	\$0.192 per hour	-\$0.192 per hour	Low	4	16GiB	EBS Only	Up
Option 2	t3.xlarge	\$0.1664 per hour	-\$0.2176 per hour	Low	4	16GiB	EBS Only	Mo
Option 3	r5.large	\$0.126 per hour	-\$0.258 per hour	Medium	2	16GiB	FBS Only	Un

Option 1 (m5.xlarge) v. Current (m5.2xlarge) [Info](#)

Statistic: Average [▼](#) Time range: Last 2 weeks [▼](#)

Key: — Current utilization ••• Recommended projected utilization

CPU utilization (percent) Memory utilization (percent) Network in (Bytes) Network Out (Bytes)

aws

Right Sizing

Not just compute : DDB, Glue, etc...

하지만 CW metric 외 사용 가능한 Cost opti 툴이 없음

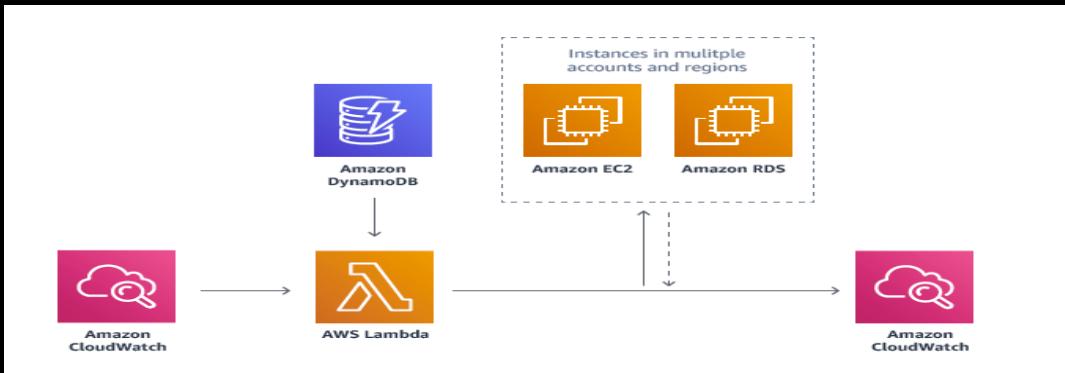
CUR 통해 가장 많이 비용이 지출되고 있는 resource 나열 후

Resource 별로 Metric 확인 후 진행



Scheduling

AWS instance scheduler



* TAG로 대상 구분

<https://aws.amazon.com/solutions/implementations/instance-scheduler/>

DynamoDB

Tables

Backups

Reserved capacity

Preferences

DAX

Clusters

Subnet groups

Parameter groups

Events

Create table Delete table

Filter by table name

Name	Status
RightsizingwithPeter-ConfigTable-NP	Active
RightsizingwithPeter-StateTable-GPF	Active

RightsizingwithPeter-ConfigTable-NPR9RY79OLGK

Overview Items Metrics Alarms Capacity Indexes Global Tables Backups Triggers Access control Tags

Create item Actions

Scan: [Table] RightsizingwithPeter-ConfigTable-NPR9R...

Viewing 1 to 11 items

type	name	description	periods
config	scheduler		
period	first-monday-in-quarter	Every first monday of each quarter	
period	office-hours	Office hours	
period	weekends	Days in weekend	
period	working-days	Working days	
schedule	korea-office-hours	Office hours in Korea	{ "office-hours" }
schedule	running	Instances running	
schedule	scale-up-down	Vertical scaling on weekdays, based on UTC time	{ "weekends@t2.nano", "working-days@t2.micro" }
schedule	seattle-office-hours	Office hours in Seattle (Pacific)	{ "office-hours" }
schedule	stopped	Instances stopped	
schedule	uk-office-hours	Office hours in UK	{ "office-hours" }

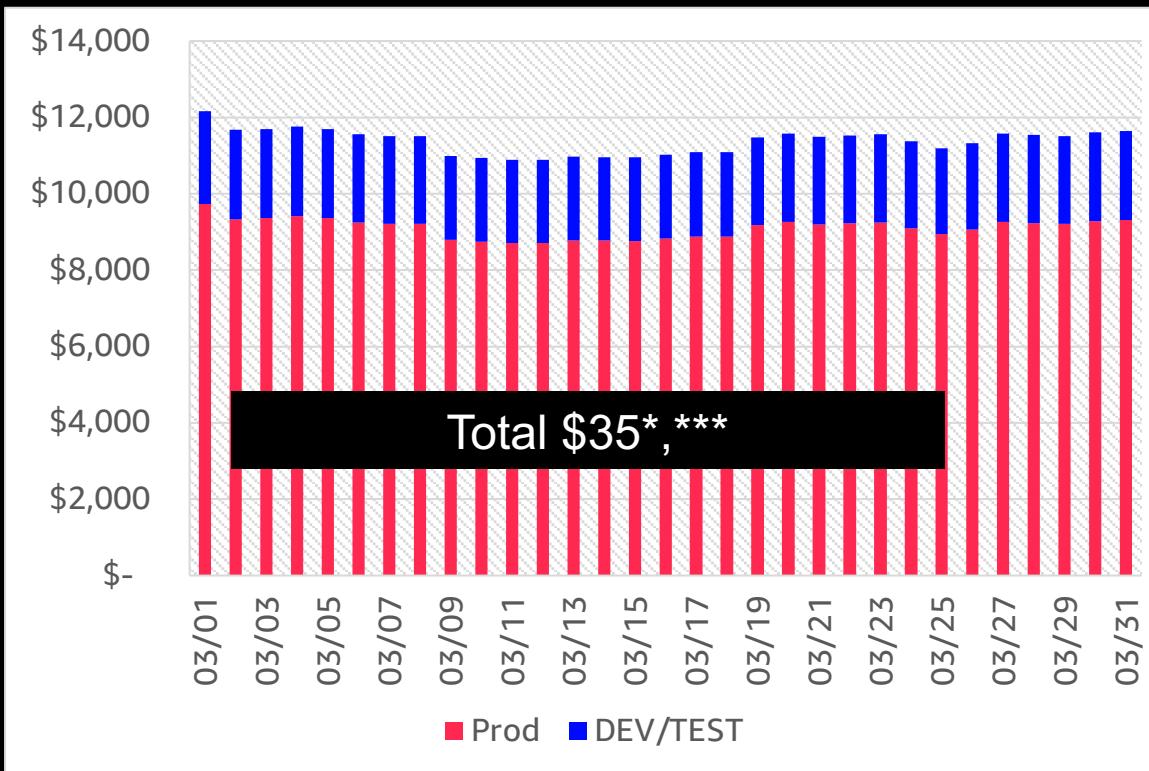
Feedback English (US)

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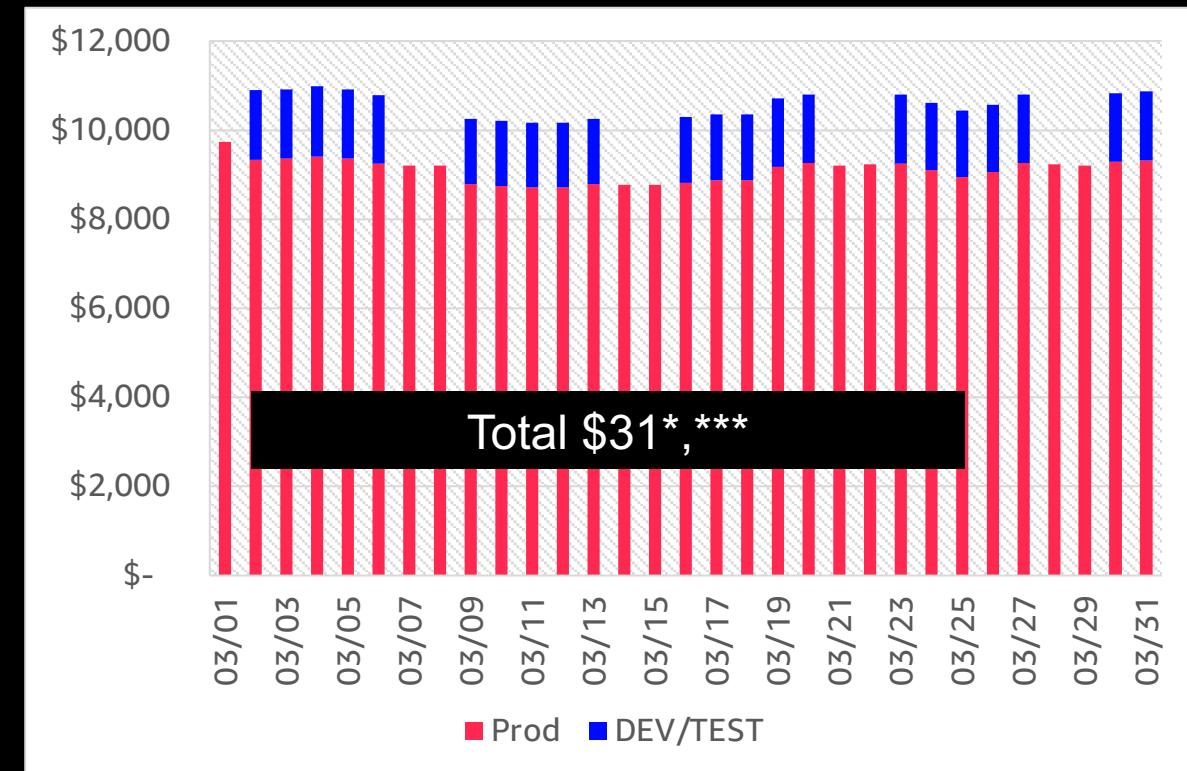
aws

Scheduling

Scheduling 적용 전



Scheduling 적용 후



Cost Explorer에서 제공하는 Recommendation 기능 활용

Recommendation parameters [Info](#)

Savings Plans type

- Compute Savings Plans**
Applies to EC2 instance usage, AWS Fargate, and AWS Lambda service usage, regardless of region, instance family, size, tenancy, and operating system.
- EC2 Instance Savings Plans**
Applies to instance usage within the committed EC2 family and region, regardless of size, tenancy, and operating system.
- SageMaker Savings Plans**
Applies to SageMaker service usage, regardless of region, instance family, and component.

Recommendation options

Recommendation level Info	Savings Plans term	Payment option	Based on the past
<input checked="" type="radio"/> Payer	<input checked="" type="radio"/> 1-year	<input checked="" type="radio"/> All upfront	<input type="radio"/> 7 days
<input type="radio"/> Linked account	<input type="radio"/> 3-year	<input type="radio"/> Partial upfront	<input checked="" type="radio"/> 30 days
		<input type="radio"/> No upfront	<input type="radio"/> 60 days

SP/RI

Recommendations (1) [Info](#)
Date last updated Apr 25, 2021 08:20:52 UTC

Before recommended purchase	After recommended purchase	
Current monthly on-demand spend \$428.70 (\$0.59 per hour)	Estimated monthly spend \$323.77 (\$0.44 per hour)	Estimated monthly savings \$104.93 (\$0.14 per hour)

Recommendation details

You could save an estimated \$105 monthly by purchasing the recommended Compute Savings Plan.

Based on your past 30 days of usage, we recommend purchasing 1 Savings Plan with a total commitment of \$0.396/hour for a 1-year term. With this commitment, we project that you could save an average of \$0.14/hour - representing a 24% savings compared to On-Demand. To account for variable usage patterns, this recommendation maximizes your savings by leaving an average \$0.05/hour of On-Demand spend. Recommendations require up to 24 hours to update after a purchase.

Recommended Savings Plans

[Download CSV](#) [Add Savings Plans to cart](#)

< 1 > [View all](#)

<input checked="" type="checkbox"/> Savings Plans term	Payment option	Commitment	Estimated savings
<input checked="" type="checkbox"/> 1-year	All upfront	\$0.396/hour	\$0.14 (24%)



SP/RI

Type별 시간 단위 베이스 라인 설정이 중요 – CUR 사용

- * 베이스 라인을 시간 단위로 확인하지 않으면 향후 SP/RI Utilization이 100%가 안될 경우가 발생
- * SP 구매 시 OS 별 시간당 단가가 다르기 때문에 OS 별 SP 단가 확인 후 Merge 필요

구분	EC2	RDS	Elasticsearch	ElastiCache	Redshift
Size flexibility within family	O(SP) △(RI, Linux only)	△ (Oracle LI X)	X	X	X



SP/RI

예1) 베이스 라인을 일단위로 하여 확인 후 구매하면...(보통 Cost explorer로 확인)

하루를 기준으로

0시 ~ 12시 4개의 인스턴스 사용, 12 ~ 24시 2개의 인스턴스 사용

총 72시간($12 * 4 + 12 * 2$), 이를 24시간으로 나누면 하루 평균 3개의 인스턴스를 사용하는 것으로 계산(표현)이 되지만,

만약 RI를 3개를 구매하게 되면 12~24시 사이에는 1개만큼의 RI가 남게 됨

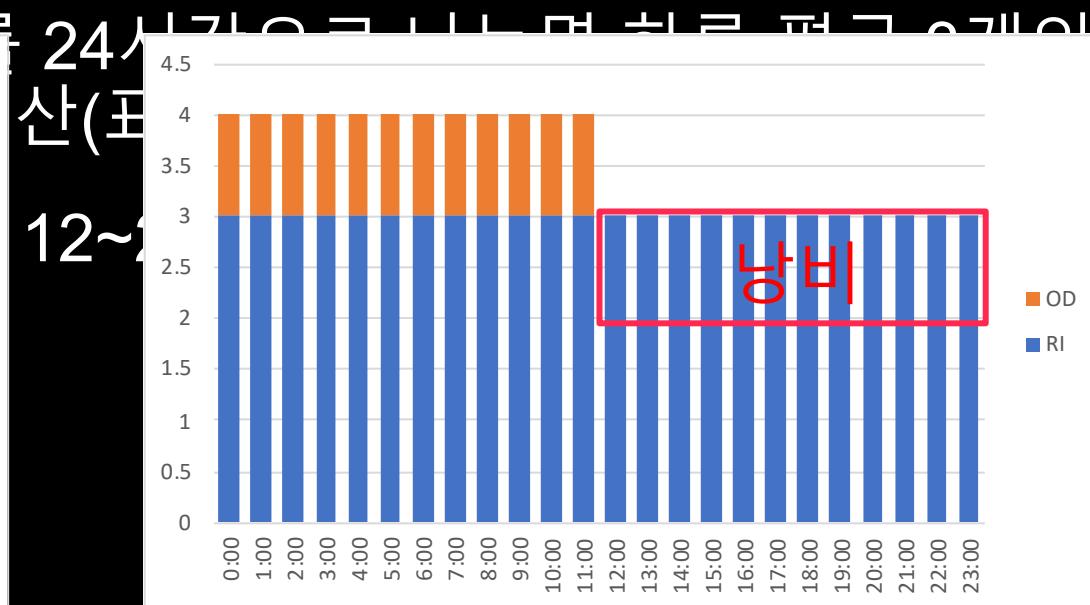
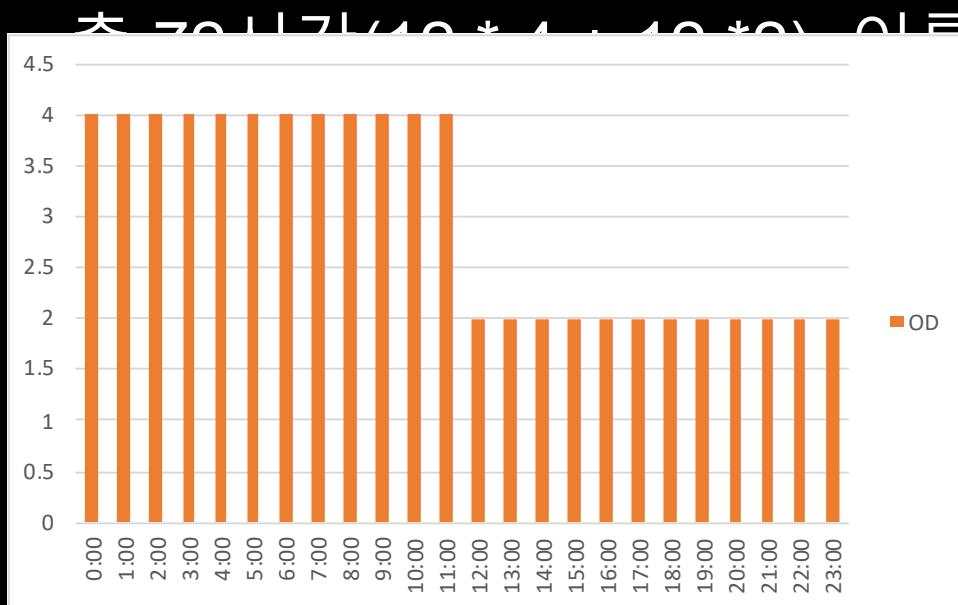


SP/RI

예1) 베이스 라인을 일단위로 하여 확인 후 구매하면...(보통 Cost explorer로 확인)

하루를 기준으로

0시 ~ 12시 4개의 인스턴스 사용, 12 ~ 24시 2개의 인스턴스 사용



SP/RI

예2) OS별 단가 확인 후 SP 구매(*RI는 구매 시 OS 구분 있음)

Amazon Linux t3.small 1대, t3.medium 1대, Windows t3.small 1대

총 3대에 대한 SP, RI 구매 방법

RI - Linux type t3.small 3대(혹은 small 1대, medium 1대), Windows type t3.small 1대 구매

SP - 시간당 \$0.0812 commit

Select a OS and tenancy to view rates					
Operating system	Tenancy				
Linux	Shared				
Viewing 7 of 94 available instances					
Instance name	Savings Plans rate	Savings over On-Demand	On-Demand rate	Operating system	Tenancy
t3.nano	\$0.0039	40%	\$0.0065	Linux	Shared
t3.micro	\$0.0079	39%		Linux	Shared
t3.small	\$0.0157	40%	\$0.052	Linux	Shared
t3.medium	\$0.0314	40%		Linux	Shared

Select a OS and tenancy to view rates					
Operating system	Tenancy				
Windows	Shared				
Viewing 7 of 94 available instances					
Instance name	Savings Plans rate	Savings over On-Demand	On-Demand rate	Operating system	Tenancy
t3.nano	\$0.0085	23%	\$0.0111	Windows	Shared
t3.micro	\$0.0171	23%	\$0.0222	Windows	Shared
t3.small	\$0.0341	23%	\$0.0444	Windows	Shared



SP/RI

Budget 을 통한 RI/SP Utilization alert 설정

Select budget type

Select which type of budget you would like to create.

- Cost budget**
Monitor your costs against a specified amount and receive alerts when your user-defined thresholds are met.
- Usage budget**
Monitor your usage of one or more specified usage types or usage type groups and receive alerts when your user-defined thresholds are met.
- Reservation budget**
Track the RI Utilization or RI Coverage associated with your reservations. These budgets support Amazon EC2, RDS, Redshift, ElastiCache and Elasticsearch reservation models.
- Savings Plans budget**
Track the utilization and coverage associated with your Savings Plans.

Budget details

Name
RI utilization

Period
Daily

Reservation budget type
 RI Utilization
 RI Coverage

Service
EC2-Instances (Elast...)

Utilization threshold
100 % Last day's utilization 0%

Configure alerts

You can send budget alerts via email and/or Amazon Simple Notification Service SNS topic ARN.

Utilization threshold [Edit](#)
100%

Alert 1

Notify the following contacts when utilization falls [below 100%](#).

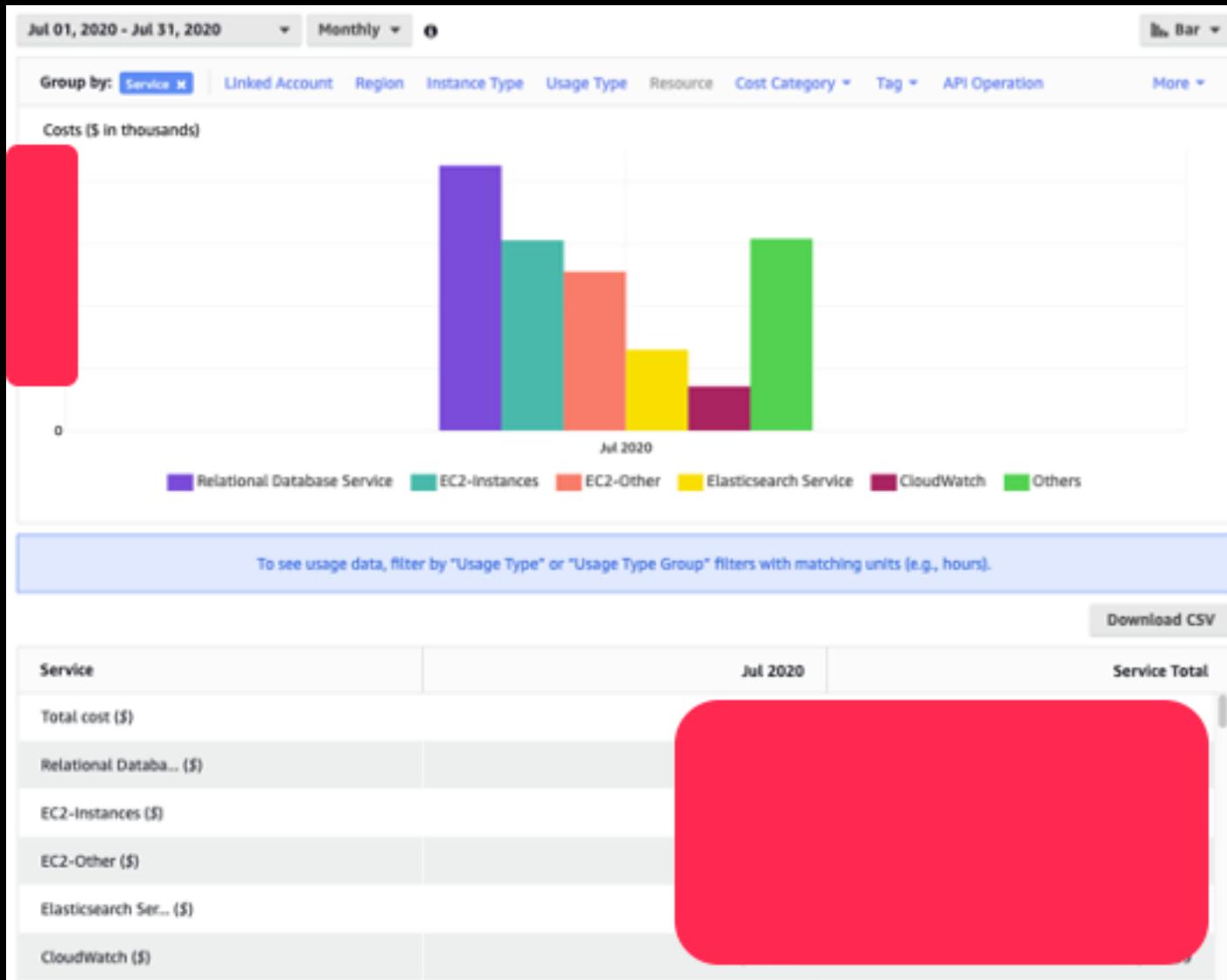
Email contacts

pryng@amazon.com [X](#)

our budget >



Get started from Cost Explorer and CUR



Top 10 Services	7월
Relational Database Service	\$ xxx,xxx
EC2-Instances	\$ xxx,xxx
EC2-Other	\$ xxx,xxx
Elasticsearch Service	\$ xxx,xxx
CloudWatch	\$ xx,xxx
ElastiCache	\$ xx,xxx
DynamoDB	\$ xx,xxx
S3	\$ xx,xxx
Redshift	\$ xx,xxx
CloudFront	\$ xx,xxx



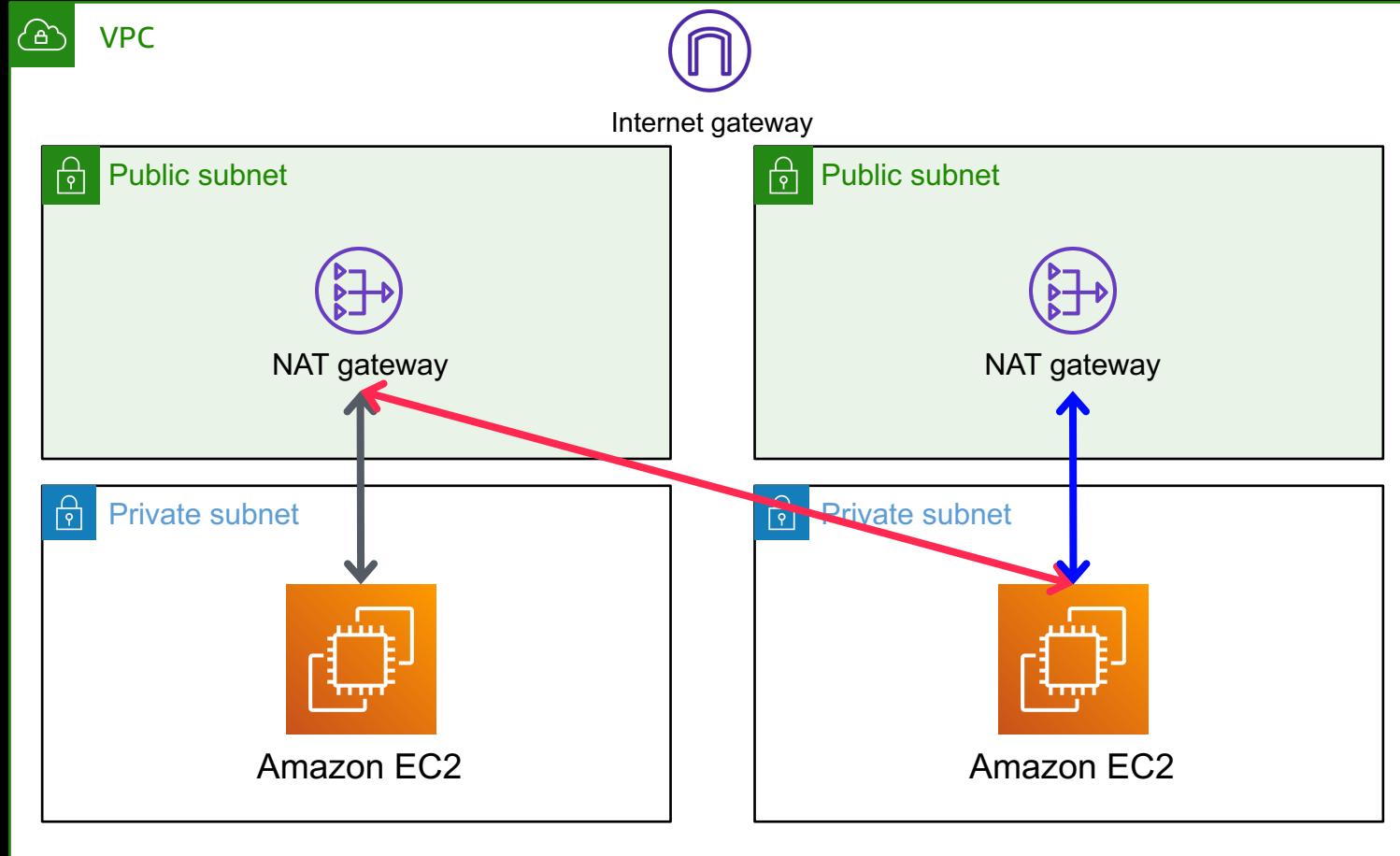
Get started from Cost Explorer and CUR

Type	Cost(\$)	내용
APN2-CW:Requests	\$ xx,xxx	GetMetricStatistics, ListMetrics, PutMetricData, GetDashboard, ListDashboards, PutDashboard and DeleteDashboards
APN2-CW:GMD-Metrics	\$ xx,xxx	GetMetricData
APN2-CW:MetricMonitorUsage	\$ x,xxx	Custom Metric + EC2 Detail monitoring
APN2-DataProcessing-Bytes	\$ x,xxx	CW Log(RDS 등)
APN2-S3-Egress-Bytes	\$ x,xxx	VPC flow Log to S3
APN2-VendedLog-Bytes	\$ x,xxx	VPC flow Log to CW Log
APN2-CW:ContributorEventsManaged	\$ x,xxx	CloudWatch Contributor Insights for DynamoDB
TO see usage data, filter by "Usage Type" or "Usage Type Group" filters with matching units (e.g. hours).		
APN2-CW:Requests	Account Number	cost
1	801254512044(운영)	\$ xx
2	536288110718(운영)	\$ xx
3	777440721853(운영)	\$ xx
4	543178796873(개발)	\$ x,xxx
5	169848565615(테스트)	\$ xx,xxx
6	4631712222(운영)	\$ xx,xxx

Top 10 Services	7월
Relational Database Service	\$ xxx,xxx
EC2-Instances	\$ xxx,xxx
EC2-Other	\$ xxx,xxx
Elasticsearch Service	\$ xxx,xxx
CloudWatch	\$ xx,xxx
ElastiCache	\$ xx,xxx
DynamoDB	\$ xx,xxx
S3	\$ xx,xxx
Redshift	\$ xx,xxx
CloudFront	\$ xx,xxx



Cost opti. Tips - Inter AZ Traffic



회통 통월화를 위해 NAT Routing을 사용하는 Routing Table의 Subnet을 위해 Private subnets의 Routing Table을 1개로 사용

-> Inter AZ Traffic cost 발생 (IN/OUT \$0.01/GB)

Cost opti. Tips - S3

요건

파일 용량 1,000 GB, 파일 개수 20,000,000개, 3년 보관

단가

S3 standard - \$0.025 per GB

Glacier - \$0.005 per GB

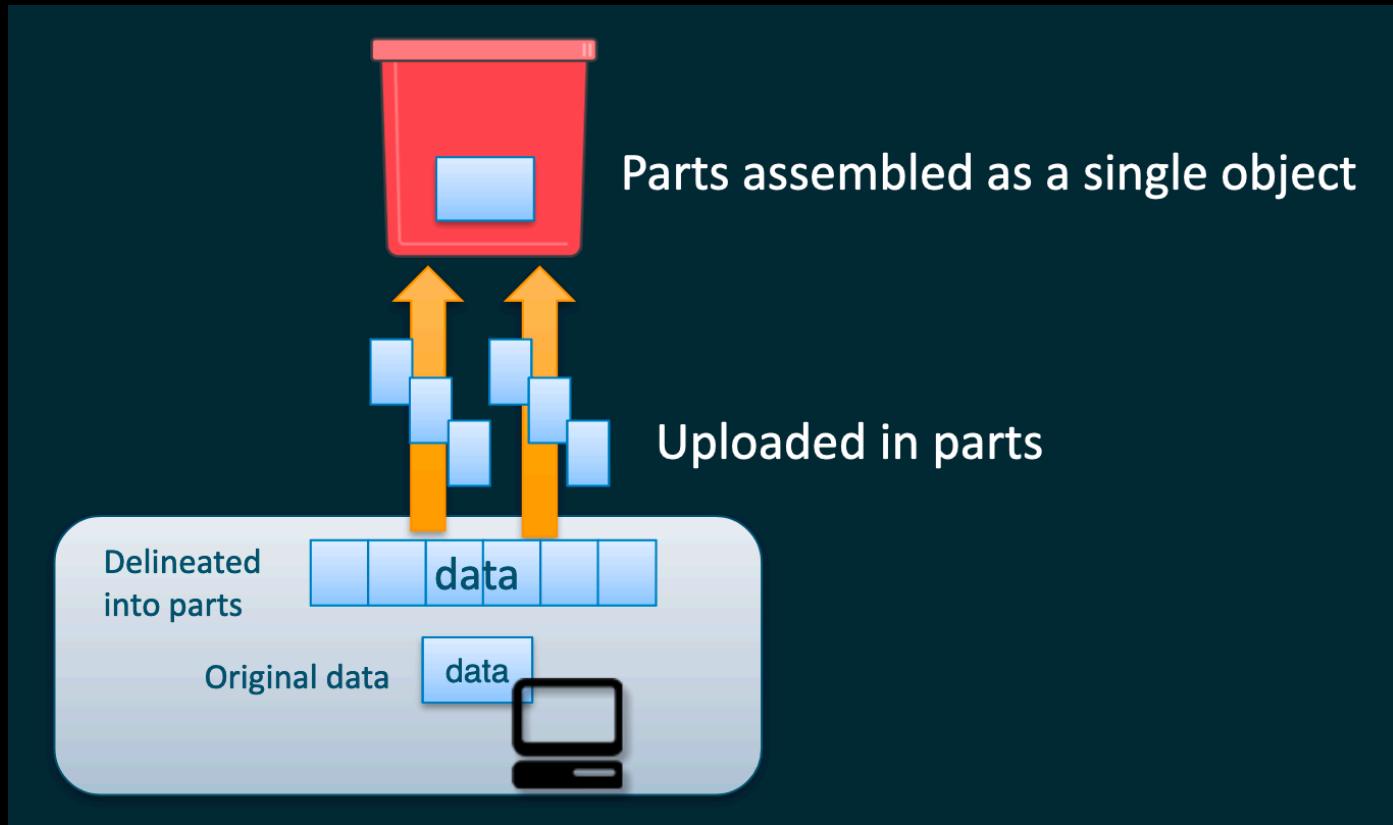
Lifecycle Transition \$0.0543 per 1,000 objects

S3 standard 에 보관 - \$900($0.025 * 1000 * 36$)

Glacier로 transition 하여 보관 - \$1,266($0.005 * 1000 * 36 + 20000000 / 1000 * 0.0543$)

Cost opti. Tips - S3

. Multi-part Upload 정리

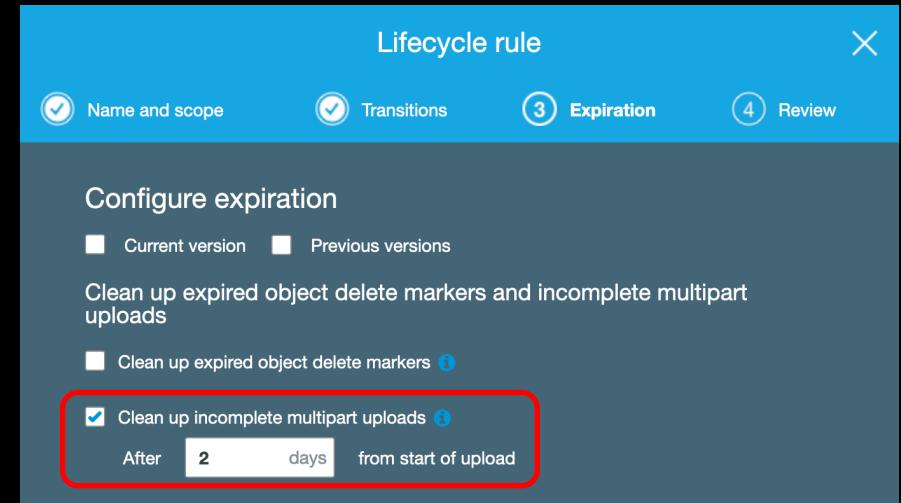


```
$aws s3api list-multipart-uploads --bucket <value>
```

-> upload-id, key 확인

```
$aws s3api list-part --bucket <value> --key <value> -- upload-id <value>
```

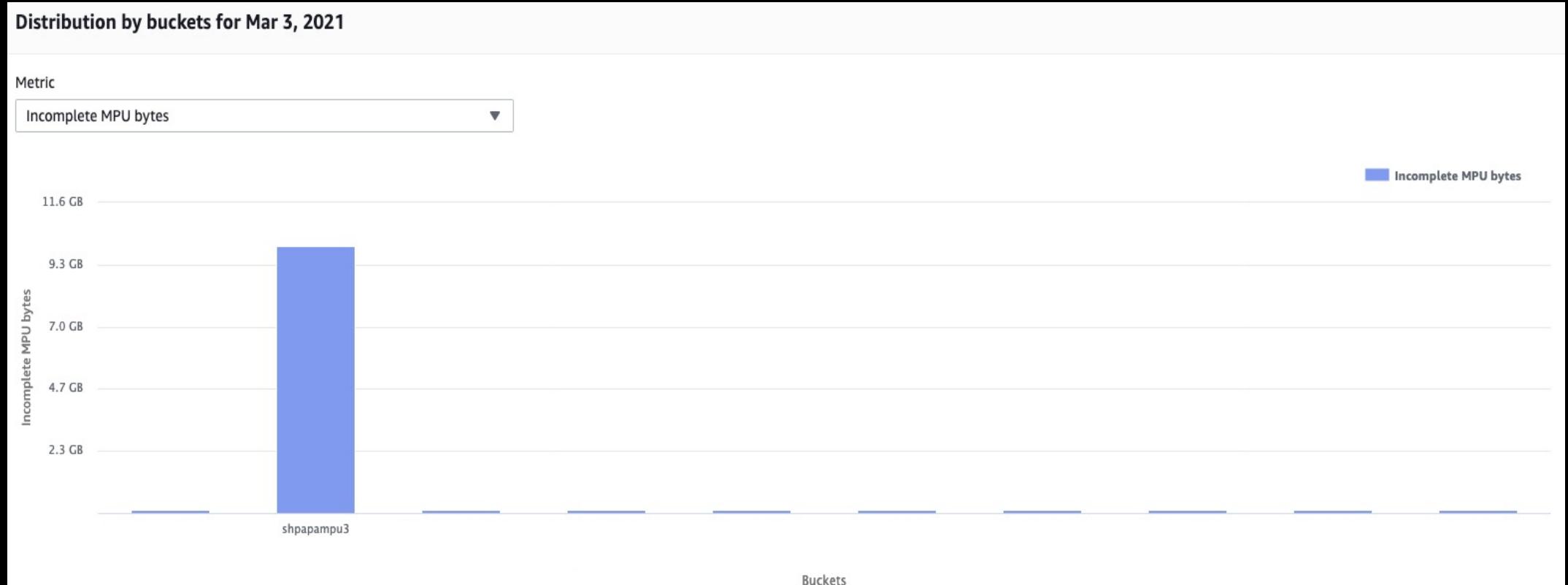
-> part , size 확인



Cost opti. Tips - S3

NEW!

S3 -> Storage Lens -> Dashboard를 통해 확인 (Incomplete MPU Byte 필터)



⌘ Organizations을 통해 여러 계정을 한번에 관리 가능

https://docs.aws.amazon.com/AmazonS3/latest/userguide/storage_lens_with_organizations.html

Cost opti. Tips - CW

- . VPC flow log 적재 시 2가지 옵션

Cloudwatch Logs Vs S3

비용 측면에서는 S3에 적재하는 것이 50% 저렴함.

분석 측면에서는 Logs는 바로 console에서 바로 검색이 가능하기 때문에 용이함. (S3는 athena를 이용하거나 직접 download 받아서 확인)

보통 이슈 상황에서만 활용을 하기에 S3로 적재하는 것을 권고

- . RDS 관련 로그가 CW Logs에 적재할 수 있음(Slow log, General log 등)

Logs에 쌓이는 데이터가 많을수록 비용이 많이 발생하기 때문에 DB 별 중요도를 고려하여 Log level을 정할 필요가 있음



감사합니다!

