

COST OPTIMIZATION

DevOps.com
WEBINAR

How Uber ATG Reduced AWS Costs 15% in 30 Days



Uber aws nOps

How Uber ATG Reduced AWS Costs 15% in 30 Days



NICK COBB

Senior Engineering Manager, Infrastructure Platform, Advanced Technologies Group - Uber

Uber ATG



JON MYER

Partner Solutions Architect, Cloud Management Tools - AWS



JT GIRI

CEO & Founder - nOps



Uber ATG

ATG's goal is to bring self-driving transportation to everyone and everything. Our mission is to introduce self-driving technology to the Uber network to make transporting people and goods safer, more efficient, and more affordable around the world.



Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, offering over 175 fully featured services from data centers globally. Millions of customers—including the fastest-growing startups, largest enterprises, and leading government agencies—are using AWS to lower costs, become more agile, and innovate faster.



nOps is a SaaS cloud management platform designed to help rapid-growth companies build, manage, and run a well-architected AWS infrastructure that is secure, cost-optimized, reliable, efficient, and operationally excellent. And, to help you keep it that way.



Topics



**Uber ATG's
Tactics for Cost
Optimization**



**More Tactics to
Reduce Costs
Now**



What's Next?





Identify the most expensive services

For Uber ATG, these were:



Amazon EC2



Amazon S3



Amazon RDS

Reducing EC2 costs



Rightsizing



**Unused Amazon
EBS volumes**



**Spot
instances**

Resource rightsizing

The screenshot shows the nOps interface for Resource RightSizing. The top navigation bar includes 'Change Management', 'Rules', 'Reports', 'Cost Control', and 'Security'. The main header displays 'Resource RightSizing' and a 'Download CSV' button. The left sidebar contains filters for 'EC2', 'RDS', and 'S3'. The main content area shows a summary of 21 total resources and \$624.68 in total possible savings. Below this is a 'List of EC2 Resources' table with columns for Resource Name, Current Config, Suggested Config, Current Cost, New Cost, Savings, and Action.

Filters [Clear All](#)

Search for anything..

AWS ACCOUNT

- nclouds (\$627.08)
- account-prod (\$0.00)
- nclouds-728471903238 (\$0.00) **FIX PERMISSION**
- nclouds-503487448993 (\$0.00) **FIX PERMISSION**

INSTANCE TYPES

- All
- t2.medium

Total Resources: 21

Total possible savings: \$624.68

List of EC2 Resources

[All](#) [Reserved Instance](#) [Part of Autoscaling](#)

RESOURCE Name	CURRENT Config	SUGGESTED Config	CURRENT COST Monthly (\$)	NEW COST Monthly (\$)	SAVINGS Monthly (\$)	ACTION
prod-celery-ecs-2 ECS host	m5.xlarge	m5.large	138.24	69.12	69.12	>
prod-celery-ecs-2 ECS host	m5.xlarge	m5.large	138.24	69.12	69.12	>
prod-celery-ecs-2 ECS host	m5.xlarge	m5.large	138.24	69.12	69.12	>

Usage type & operation type

Example: Finding resources related to bandwidth utilization

For Amazon EC2, address lesser-known costs:

- Where is growth occurring and what confidence levels do you have in that growth?
- What % of the EC2 billing is for data transfer between AZs?
- How much are you spending on Amazon EBS volumes?
 - nOps - How many are orphaned after EC2 volumes have been removed?
- For GPUs - if your organization is using GPUs, standardize on a set of tools and find a way to gate costly usage on GPU utilization %.
 - ATG - 60-65% threshold for utilization; respective of other dependencies like network or storage.
 - \$24/hr is obscenely expensive if you don't have good training architecture and tool sets; provisioning.
 - Match chips to needs; measure wall-clock trade-offs of reducing the costs.

Networking costs

How much is using the cloud costing you?
With other environments?

Determine your network costs:

- If you run multiple regions or environments (particularly on-premises), network egress essentially becomes “fixed cost.”
- Understand the costs of network egress as a % of your business.
- Helps you dig into areas of waste or allow for more efficient usage of resources outside of cloud zones, reduce payloads, etc. – to spend this “fixed cost” more effectively.



Network cost correlation to resources

The screenshot shows the nOps Cost Control interface. A modal window is open, displaying the cost details for USW2-NatGateway-Hours from March 20, 2020, to April 18, 2020. The modal has tabs for Resources, Operations, and Usage Types. Under the Resources tab, it shows a total of 63 resources. A table lists several resources with their IDs and costs.

RESOURCE ID	COST
prod-natgateway-2b	\$279.62
prod-natgateway-2a	\$130.83
uat-natgateway-2b	\$54.5
uat-natgateway-2a	\$50.28
jenkins-ecs-V2	\$32.17
nat-03229fa6d94694084	\$31.95

Snapshot cost

Cost details of CreateSnapshot for "Mar 21, 2020 to Apr 19, 2020"

Resources Operations Usage Types

Total 100 Resources

RESOURCE ID	COST
aws snap-0d3c720b9bb067b68	\$11.86
aws snap-0bba04b0661a27727	\$11.82
aws lpubdata	\$11.04
aws snap-0b4b310fd389dd110	\$5.69
aws snap-0bd47307b1a26f3dc	\$3.72
aws giorgio-braincheck-20180323	\$3.09
aws snap-03fe61bcc97aeefca	\$2.03
aws snap-0539dc22cab5f94b8	\$1.94
aws snap-c45fec4e	\$1.89





Metrics that matter

Net Monthly Cost Growth Rate (new feature in nOps)

- Monthly growth rate can show hidden costs – like increasing bandwidth

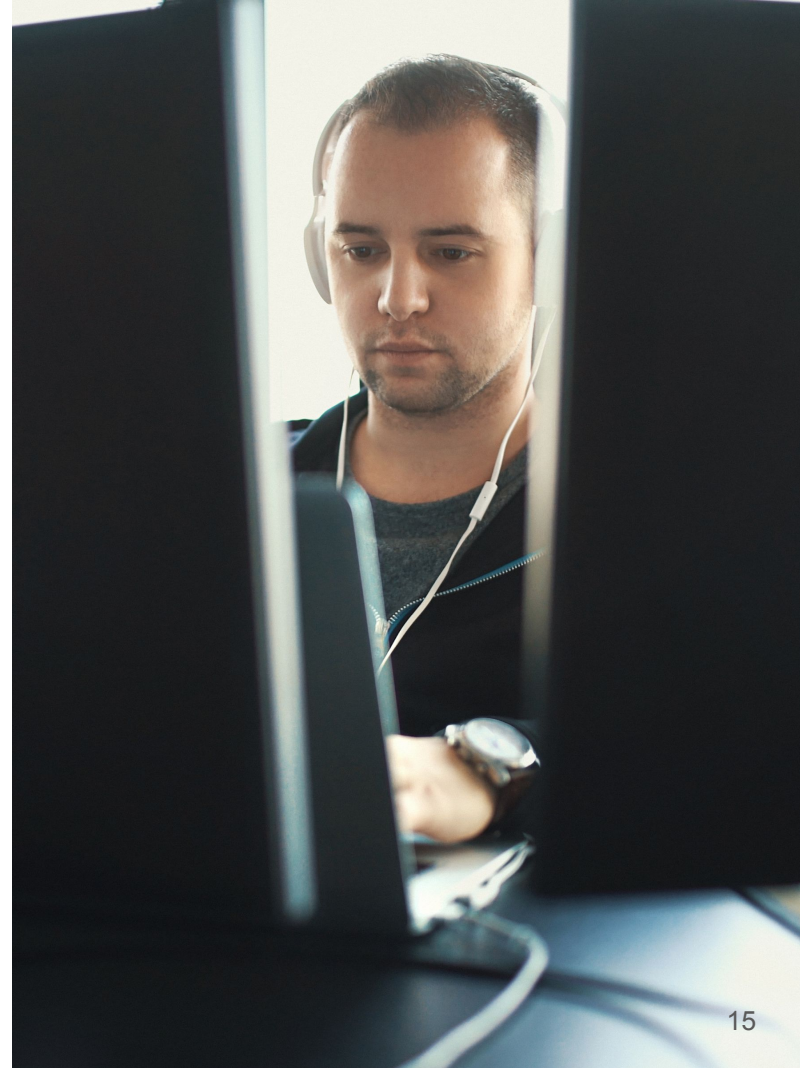
Daily spend by AWS Accounts		SEARCH		DOWNLOAD CSV			
NAME	TOTAL ↕	NET MRC GROWTH (3M) ↕	APR-19 ↕	APR-18 ↕	APR-17 ↕	APR-16 ↕	APR-15 ↕
Total Spend	\$13,408.44	---	\$8.55	\$79.75	\$806.09	\$888.55	\$180.45
nclouds-aa	\$9,423.21	+21.48%	\$8.40	\$79.44	\$805.66	\$888.06	\$180.05
nclouds	\$3,970.97	-12.24%	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
nOps Secondary AC	\$10.84	-26.65%	\$0.15	\$0.31	\$0.32	\$0.39	\$0.30

MRC growth for products

Daily spend by AWS Products		SEARCH						DOWNLOAD CSV
NAME	TOTAL ↕	NET MRC GROWTH (3M) ↕	APR-19 ↕	APR-18 ↕	APR-17 ↕	APR-16 ↕	APR-15 ↕	
Total Spend	\$13,408.44	---	\$8.54	\$79.76	\$806.08	\$888.55	\$180.43	
 Amazon Elastic Compute Cloud	\$4,230.15	-13.09%	\$0.00	\$28.96	\$131.32	\$136.28	\$79.30	
 Amazon Relational Database Service	\$2,022.01	+28.72%	\$0.00	\$22.63	\$610.92	\$676.50	\$20.10	
 Amazon Elasticsearch Service	\$730.03	-18.14%	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
 Amazon Virtual Private Cloud	\$424.95 !	+67.24%	\$0.00 !	\$6.68 !	\$18.24 !	\$18.23 !	\$18.24 !	

Reducing Amazon S3 costs

- ✓ S3 bucket with no traffic
- ✓ Amazon CloudWatch log groups with no traffic
- ✓ Rightsizing resources



Reducing Amazon S3 costs

Do you need all of that data?

- Uber has vast amounts of sensor data from driving cars, but most of it doesn't need to be "hot" (readily accessible).
 - TTL as much as possible, then archive the rest.
- Look for opportunities to extract the most useful data and archive or delete the rest.
- Estimate storage growth and impact over time to determine where to use cloud-native configuration and where to put engineering time.
 - If you can save \$\$ by turning on bucket policies natively, don't spend time on data trimming or engineering tasks for lifecycle management.



Amazon S3 buckets with low traffic

nOps Rules / Infrequently accessed S3 bucket

Infrequently accessed S3 bucket

You may want to consider a lower cost storage option, e.g. infrequent access, Glacier

Change Management

Filters Clear All

Search for anything..

AWS ACCOUNT

- nclouds (209)
- nOps Secondary AC (16)
- nclouds-695292474035 (0)

REGIONS

- global (\$2.79)
- ca-central-1 (\$0.00)
- eu-west-3 (\$0.00)
- ap-northeast-1 (\$0.00)

Sort by | Violations type: All violations | Resources idle time: 1 Month

1 Month
3 Months
6 Months
12 Months

\$2.79 Potential savings MTD

\$0.48 Estimated savings for the next 30 days

225 List of infrequently accessed S3 bucket Download

- 3 than last month

AWS Account	RESOURCE	COST (\$)	REGION	REQUESTS COUNT	NETWORK MBYTES	ACTION
nclouds	aws-athena-query-results-202279780353-us-east-1	0	global	4625	2	

Reducing Amazon S3 costs

The screenshot shows the nOps dashboard interface. At the top, there's a search bar and navigation tabs for Change Management, Rules, Reports, Cost Control (selected), and Security. The main section is titled "Resource RightSizing" and has tabs for EC2, RDS, and S3 (selected). A "Download CSV" button is visible in the top right of the main section.

Filters [Clear All](#)

Search for anything..

AWS ACCOUNT

- nOps-UAT-695292474035 (\$703.13)
- nOps-UAT-915469964539 (\$700.02)
- nOps-UAT (\$632.43)
- san-coro (\$0.00)
- nOps-UAT-503487448993 (\$0.00)

INSTANCE TYPES

Total Resources

5

Total possible savings

\$18.75

List of S3 Resources

RESOURCE Name	CURRENT Config	SUGGESTED Config	CURRENT COST Monthly (\$)	NEW COST Monthly (\$)	SAVINGS Monthly (\$)	ACTION
veracyte-out-test	Standard	Amazon Glacier	7.95	1.47	6.47	>
nclouds-untoil-2	Standard	Amazon Glacier	5.25	1.26	4	>
nclouds-untoil-dev-data	Standard	Amazon Glacier	4.42	1.45	2.97	>
nclouds-untoil-prod-data	Standard	Amazon Glacier	4.24	1.4	2.84	>

Reducing Amazon RDS costs

- Look at **utilization levels** — often developers overprovision database instances anticipating scale that isn't coming, or won't come for a longer time period.
- DBs are very easy **instance reservations** to make due to their long life — look for these opportunities.



Reducing Amazon RDS costs

- IOPS
- Storage
- Multi-AZ

The screenshot shows the nOps dashboard interface. At the top, there's a search bar and navigation tabs for Change Management, Rules, Reports, Cost Control, and Security. The main content area displays three summary cards for potential savings: \$2,070.86 MTD, \$2,699.09 from last month, and \$3,451.44 for the next 30 days. Below these is a section titled '4 unattached Amazon RDS Provisioned IOPS volumes' with a 'Download' button. A table lists these volumes with columns for AWS Account, Resource Name, Region, Capacity, Status, Provision IOPS, IOPS Use Days, IOPS Use Week, Cost (\$), Estimated Monthly saving, and Action.

AWS ACCOUNT	RESOURCE NAME	REGION	CAPACITY	STATUS	PROVISION IOPS	IOPS Use Days	IOPS Use Week	COST (\$)	ESTIMATED Monthly saving	ACTION
	proddb6c	us-west-1	100	available	1000	16	2	501.07	92.8	
	euproddw	eu-central-1	100	available	1000	712	101	534.36	99.6	
	euproddb	eu-central-1	100	available	1000	712	101	534.36	98.7	

Multi-AZ doubles Amazon RDS costs

The screenshot shows the nOps AWS Inventory Details page. The top navigation bar includes 'Change Management', 'Rules', 'Reports', 'Cost Control', and 'Security'. A search bar is present with the text 'Search for resources, workload, users or anything..'. The user profile 'admin nops' is in the top right. The main content area is titled 'AWS Inventory Details (6872 found)'. Below this, there are filters for 'Region', 'Select AWS Account', and 'Resource Status (Active)'. A 'Total Cost: \$5,898.61' is displayed for the period 'Apr 01 2020 - Apr 20 2020'. A summary bar shows various resource counts, with 'RDS (18)' highlighted. Below the summary, there are filter options for 'All' and 'Day'. The main table lists RDS instances with columns for Name, Engine, Type, Region, Size (GiB), CPU, AWS Account, Apr Cost, Aurora, MultiAZ DB Status, BackUp Policy / Tag, and Subnet Status. Three instances are shown: 'sysbench-test' (MySQL Standalone, db.r5.12xlarge, us-west-2, 2000 GiB, % CPU, #nOps-UAT-695292474035, \$262.20, No Aurora, Enabled MultiAZ), 'nops-prod-rds-2' (MySQL Standalone, db.m4.large, us-west-2, 200 GiB, 7.75% CPU, #nOps-UAT, \$181.28, No Aurora, Enabled MultiAZ), and 'cloudtrail-cluster-prod-0' (Aurora-Postgresql Standalone, db.r5.large, us-west-2, 1 GiB, 7.75% CPU, #nOps-UAT, \$127.02, No Aurora, Disabled MultiAZ). Each instance has a 'View details' link and a 'Private' tag.

Name	Engine	Type	Region	Size (GiB)	CPU	AWS Account	Apr Cost	Aurora	MultiAZ DB Status	BackUp Policy / Tag	Subnet Status
sysbench-test	MySQL Standalone	db.r5.12xlarge	us-west-2	2000	%	#nOps-UAT-695292474035	\$262.20	No	Enabled	View details	Private
nops-prod-rds-2	MySQL Standalone	db.m4.large	us-west-2	200	7.75%	#nOps-UAT	\$181.28	No	Enabled	View details	Private
cloudtrail-cluster-prod-0	Aurora-Postgresql Standalone	db.r5.large	us-west-2	1	7.75%	#nOps-UAT	\$127.02	No	Disabled	View details	Private

Service adoption

Service adoption & growth rate are important measures

- As new AWS services are supported or released, developers in your organization will want to test new technologies or try new innovations. Enable them to do so, but monitor service adoption and growth rates. This is key for multiple reasons:
 - Gives you + leadership visibility into what technologies are working for your business.
 - Helps align growth in particular technologies with business objectives.

Uber example:

- Amazon Athena costs were anticipated to grow on a new software platform, but did not know to what extent.
- Amazon Athena - 5000% growth!!
- Now we grow this quickly but efficiently, and can enable more use cases on this platform.
- We can also partner with AWS for more focused Athena product support, training, and discounts because we are watching this metric closely to know how important Athena is to Uber ATG.



DevOps

- Tagging, default tagging
- SSO for company-wide collaboration
- Zero-configuration notifications
- Continuous cost change management



Tagging

The screenshot shows the nOps interface for configuring notification preferences. At the top, there is a search bar and navigation links for Change Management, Rules, Reports, Cost Control, and Security. The user is logged in as 'admin nops'. The current page is 'Rules / nClouds WAR' and the title is 'Notification Preferences'.

Tag Key
owner

Tag value
dev@nclouds.com

Enable auto notifications to the users if resources are tagged with email addresses

Users who you want to Notify (optional)
Select Email address

Notify *
 Monthly Weekly Daily

Receive notifications on Slack (optional)
Please enter Slack channel name

You haven't added Slack integration in nOps - [Click here to add Slack integration](#)

Unsubscribe **Back**



Resources — Cost Optimization



How to Rightsize Amazon EC2, Amazon RDS, and Amazon S3 — Continuously

<https://www.nops.io/blog/nops-rightsized-amazon-ec2-rds-s3/>

3 Critical Signs that You're Overspending on Amazon EBS

<https://www.nops.io/blog/nops-amazon-elastic-block-store-cost/>

Boost Your AWS Infrastructure Performance — and Lower Your AWS Costs — by Detecting Low Network Utilization

<https://www.nops.io/blog/nops-aws-low-network-utilization/>

How to Optimize the Cost of Your Kubernetes Deployment

<https://www.nops.io/blog/nops-optimize-cost-kubernetes-deployment/>

Save AWS Cloud Costs by Using Tags to Detect Unused Amazon EC2 Instances

<https://www.nops.io/blog/nops-amazon-ec2-tag-violation/>

4 Tips for Implementing a Data Lake on AWS to Reduce TCO

<https://www.nclouds.com/blog/common-mistakes-data-lake-aws/>

How to Use nOps' Dashboard to Amp the Value of AWS CloudTrail

<https://www.nops.io/blog/nops-aws-cloudtrail-dashboard/>



10 things you can do today to reduce AWS costs

<https://aws.amazon.com/blogs/compute/10-things-you-can-do-to-day-to-reduce-aws-costs/>

Cost optimization e-book

https://d1.awsstatic.com/pricing/AWS_CO_Playbook_Final.pdf

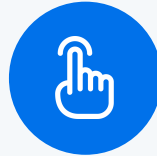
Reduce costs now – getting started

- Identify costs & monitor metrics that matter.
- Slides & webinar replay will be sent to all registrants.
- Check out the Resources.

Get nOps now



**Sign up for free,
“14-Day Trial”**



app.nops.io/signup/

AWS Partners use:
www.nops.io/nops-partner-network/



**Use code: FCOVID
Get 30 Days Free**

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