Cost Optimization with AWS

<AWS Cost Philosophy>

<Business Case for AWS Migration>

<Cost Management on AWS>

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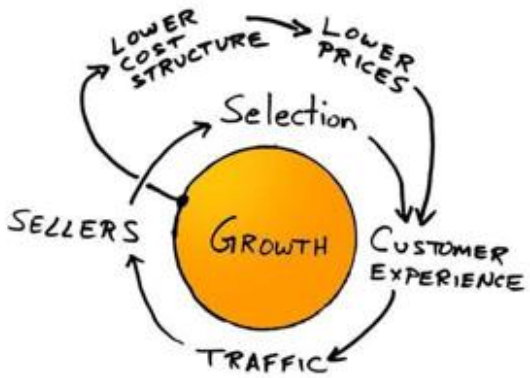
AWS Cost Philosophy

AWS philosophy in cloud services pricing

A culture that believes on passing the economic efficiencies gained from our scale back to our customers…



aws went through **133** Price Reductions since 2006

Price reduction related AWS blog

The perpetual drive to invent products that bring cost efficiencies to our customers…

Since the launch of S3 Intelligent Tiering, customers saved over $1 Billion

Since 2018, AWS has released 3 generations of custom ARM chips, named Graviton.

The latest Graviton 3 CPUs offer up to 40% better price/performance ratios over conventional CPUs, for most workloads.

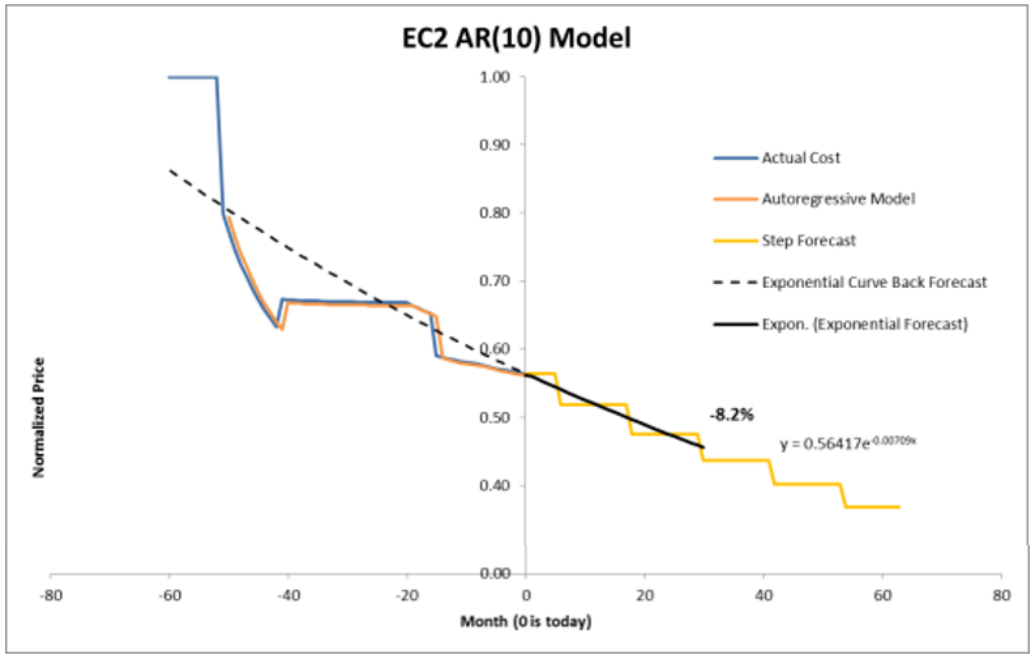
Examples of cost savings enabled by Graviton (over x86 CPUs):

1. **ML Inference** (SageMaker) – 70% lower price
2. **ML Training** (SageMaker) – 50% lower price
3. **Databases** (Aurora, RDS) – 50% lower price
4. **General purpose compute** (EC2) – 50% lower price
5. **Containers** (Kubernetes, Docker) – 40% lower price
6. **Serverless compute** (Lambda) – 34% lower price
7. **Big Data** (EMR) – 30% lower price
8. **NoSQL** (Document, Graph) – 30% lower price

Third Party Public study Modeling AWS Pricing – Compute and Storage

An in-depth public study of AWS pricing trends (conducted by US DoD – NRO office) concluded that:

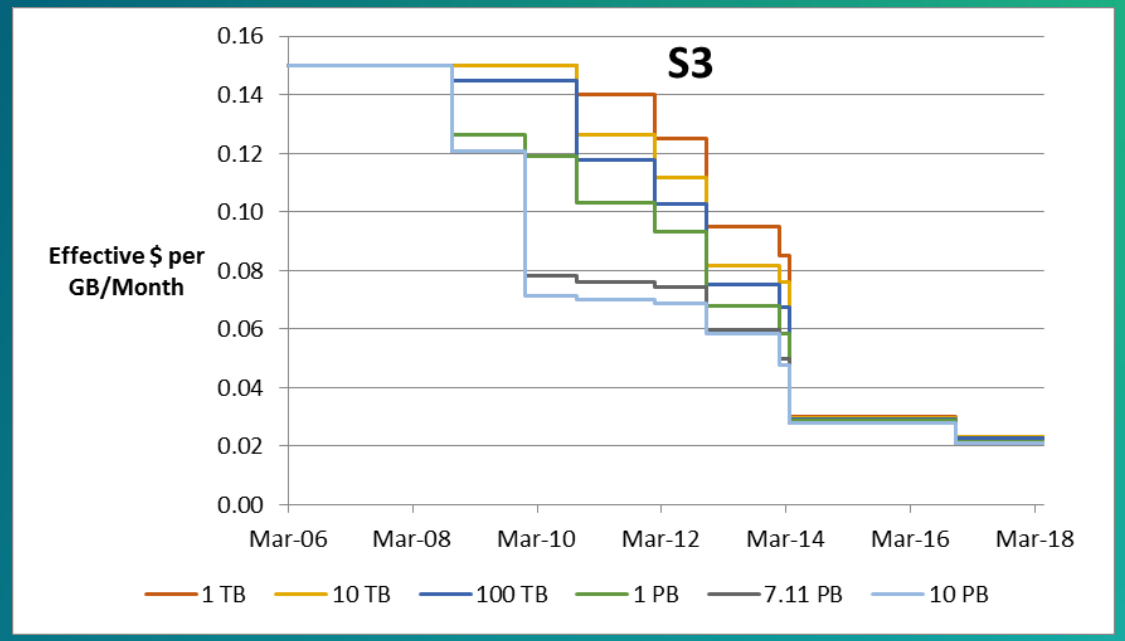
*"For the time period **since 2010**, EC2 Compute price analysis shows a **44% total price reduction**, equivalent to an annualized rate of **8.2%. There were no price increases during this time**."*



Data range: from EC2 Service launch in 2010 to 2019

An in-depth public study of AWS pricing trends (conducted by US DoD – NRO office) concluded that:

*"Over a 12 year history, AWS has reduced their storage service costs **8 times** totaling **86%** cumulatively, equivalent to **14.9%** annually - quite a significant reduction over time. Additionally, **there has never been a storage price increase."***

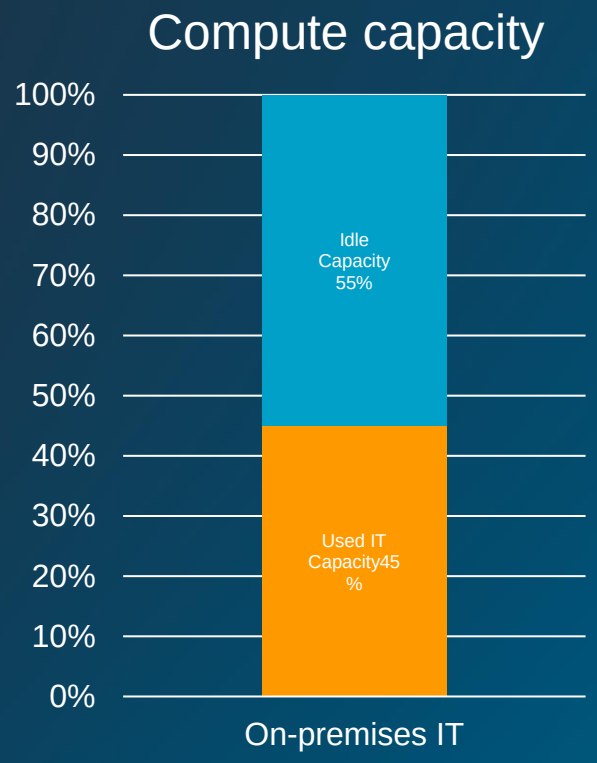


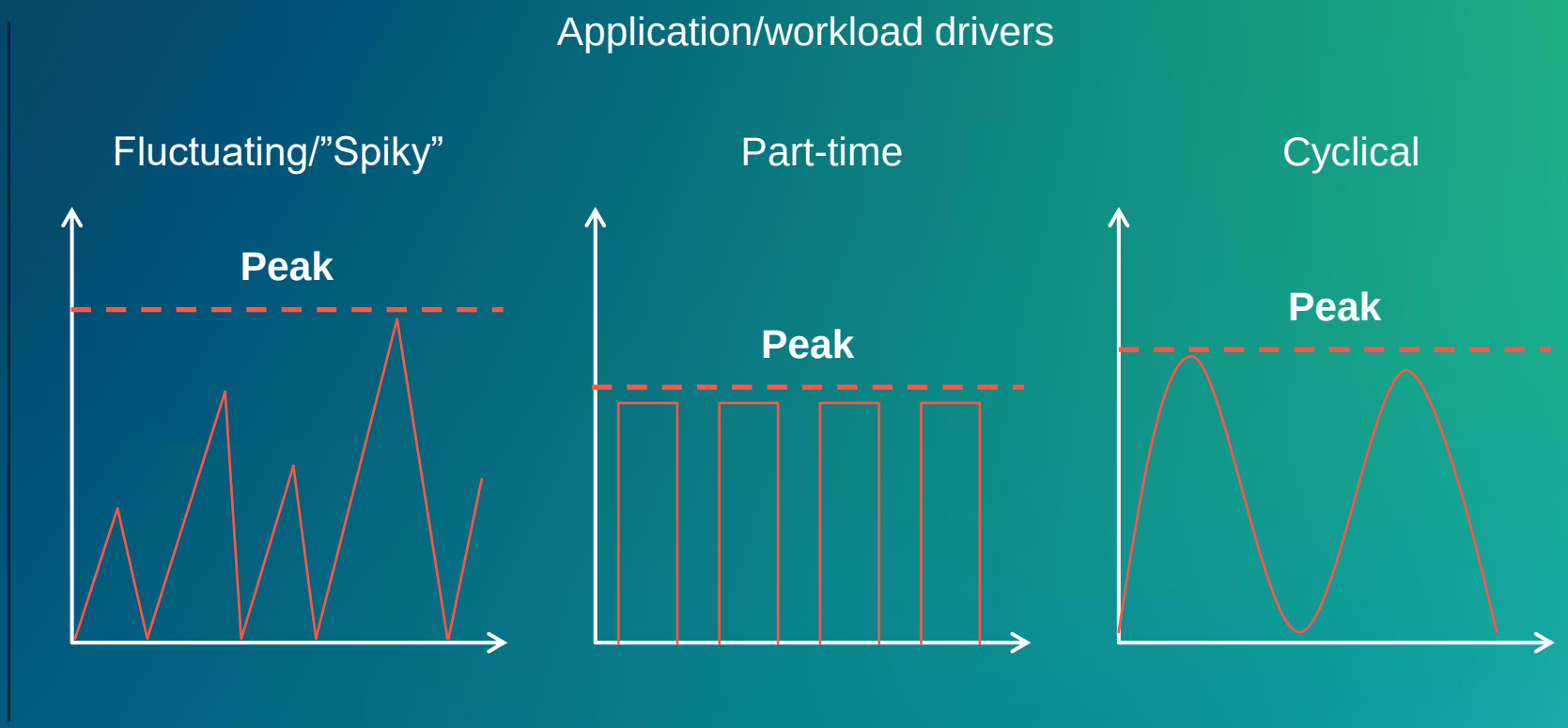
Data range: from S3 Service launch in 2006 to 2019

Business Case for AWS Migration

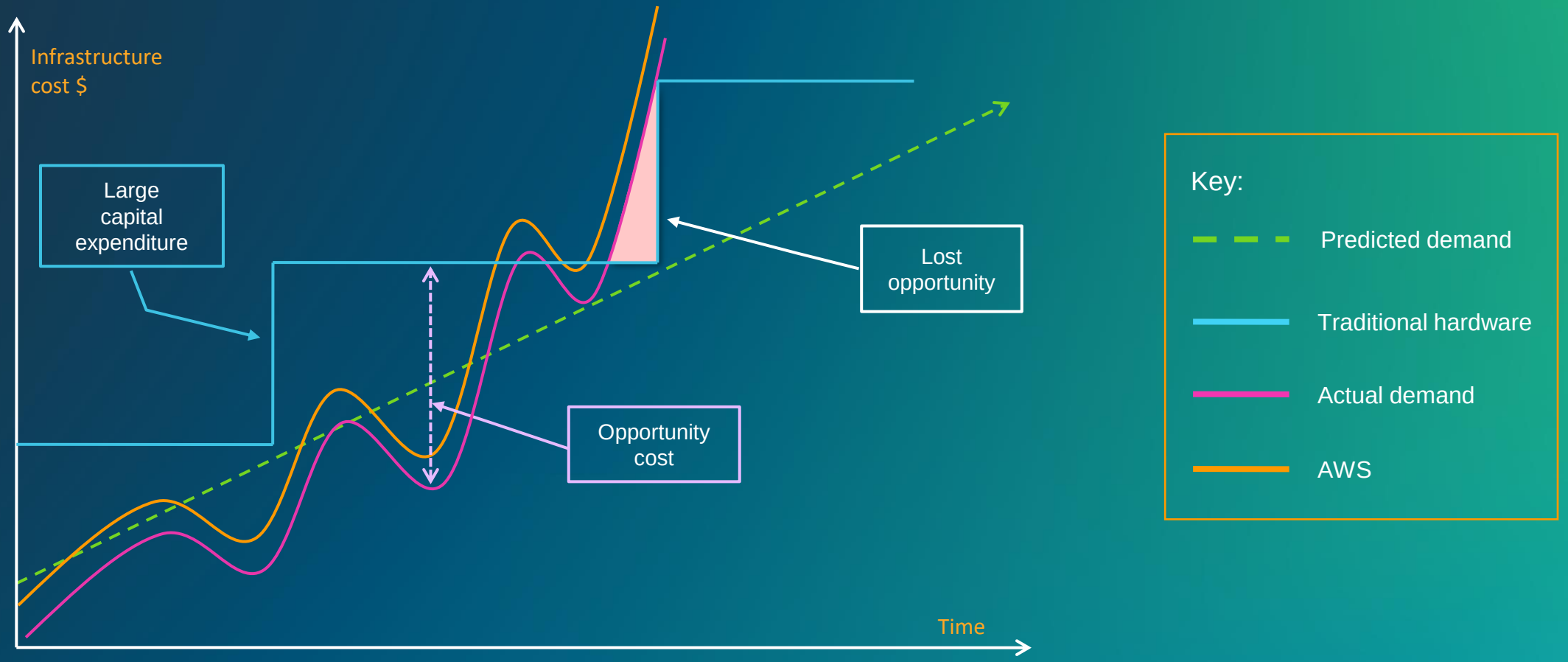
On-premises purchase for peak

Studies by Gartner, McKinsey, and the Uptime Institute have stated that typical data centers are on average **less than 50% utilized**

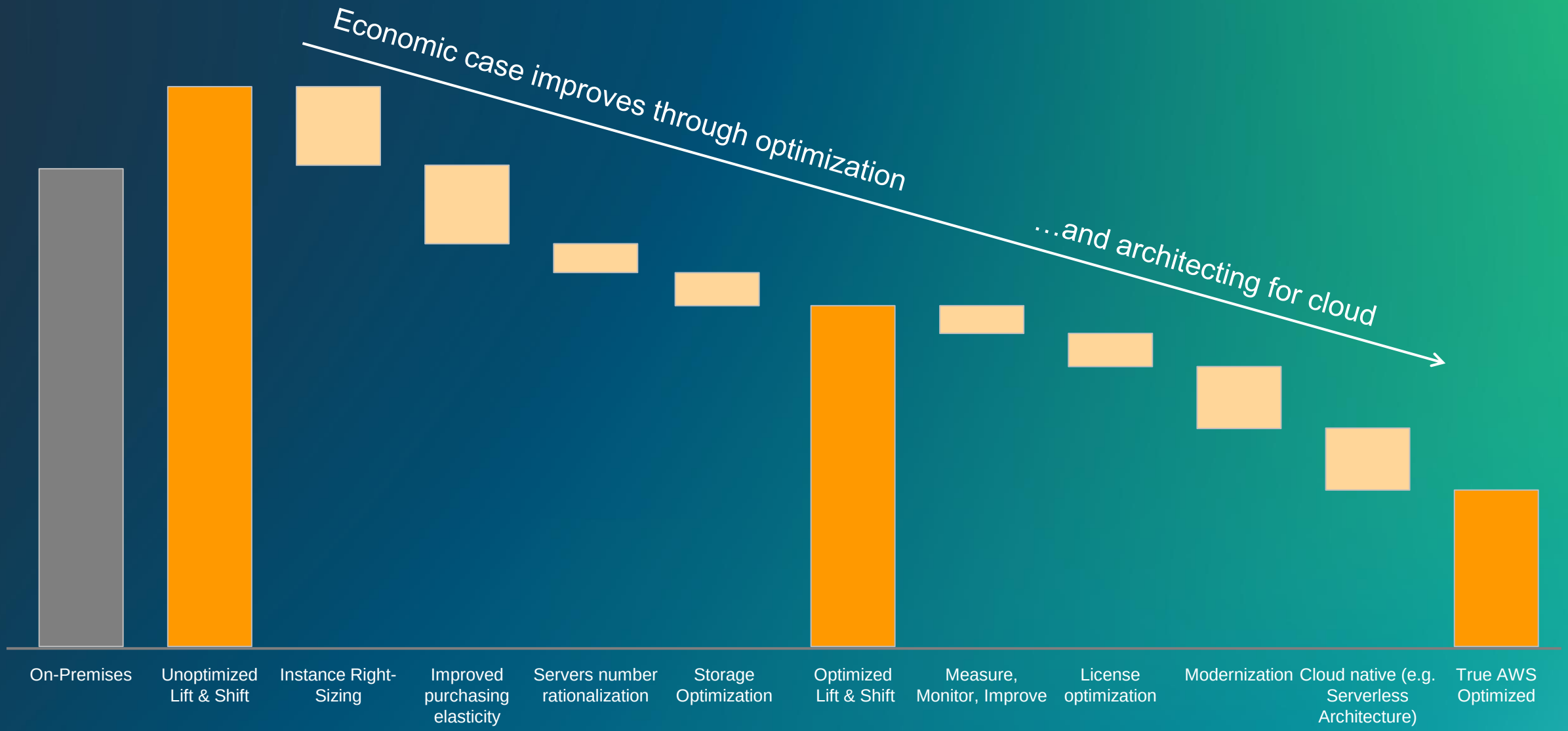




Cost Savings: Economics of the Cloud



Lowering TCO through optimization



Examples of value realized

Cost Savings (TCO)

DC footprint reduced from 8 to 3 (CapitalOne)

Storage costs reduced by up to 60% (ENEL)

Over 50% reduction in TCO (GE)

DC footprint from 45 to 6 (News Corp)

50% reduction in app costs (Time Inc.)

Cost savings of $20M p.a. (FINRA)

Computational cost reduced by 20%+ (ENEL)

Cloud deployment has saved $34M in CAPEX and reduced OPEX by 85% (Samsung)

12% reduction in OPEX (RWE Czech)

Design and launch a security-compliant solution in three months while reducing our capital expenses by 30% (Vodafone)

Savings of $1.5M p.a. (Trainline)

30% reduction in OPEX (MacMillan)

Staff Productivity

Average annual staffing savings of $3M (Adroll)

Reduced management time by 80% compared to prior cloud platform, and redeployed 3 IT staff to development efforts (iFit)

Half the infrastructure team required to manage infrastructure (2C2P)

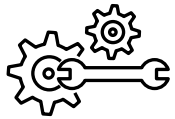
IT Infra consolidation completed in 20% of expected time (Hearst)

60% of IT working on data proliferation, lack of standards, security hardening all of which AWS is addressing (Intuit)

Over 500 hours per year of server configuration time saved (Sage)

39 years of computational chemistry condensed into 9 hours (Novartis)

"I haven't had a support callout in six months. Previously we'd have to work late at least once or twice a week. It's allowed us to refocus people's efforts onto more strategic tasks." (Graze)



Operational Resilience

Scaled to handle a 400% increase in page views (Kurt Geiger)

8,600 transactions/second (McDonalds)

Transfer of over 750 TB of data from pipeline inspection machinery (GE)

Processing over 75 billion market events daily (FINRA)

Critical applications run in multiple AZs, x-Regions for robust disaster recovery (Expedia)

Supports over 300,000 requests per minute to its API (Easy Taxi)

60% reduced downtime (Trainline)

Migration of SAP on Oracle to AWS with zero unplanned downtime across five countries (Kellogg's)

Remediation time reduced from 3 days to 80 minutes (GE Appliances)

Automatic ISO27001, PCI DSS, and HIPAA certification (Medscheme)

Business Agility

80% reduction in software R&D times (Apeejay Stya & Svrán)

Time to launch digital campaigns cut from weeks to 24 hours (91App)

Calc and reporting time cut from 10 days to 10 minutes (Aon Benfield)

Time to market cut from weeks to hours (FlyDubai)

Clinical simulations 98% faster than on-premises (Bristol-Myers Squibb)

Time to deploy IT compute reduced to <5 minutes (Alcatel-Lucent)

R&D RFS times reduced from 6 months to 1 day (NewsCorp)

Provisioning time cut from 3–4 weeks to 2 days (ENEL)

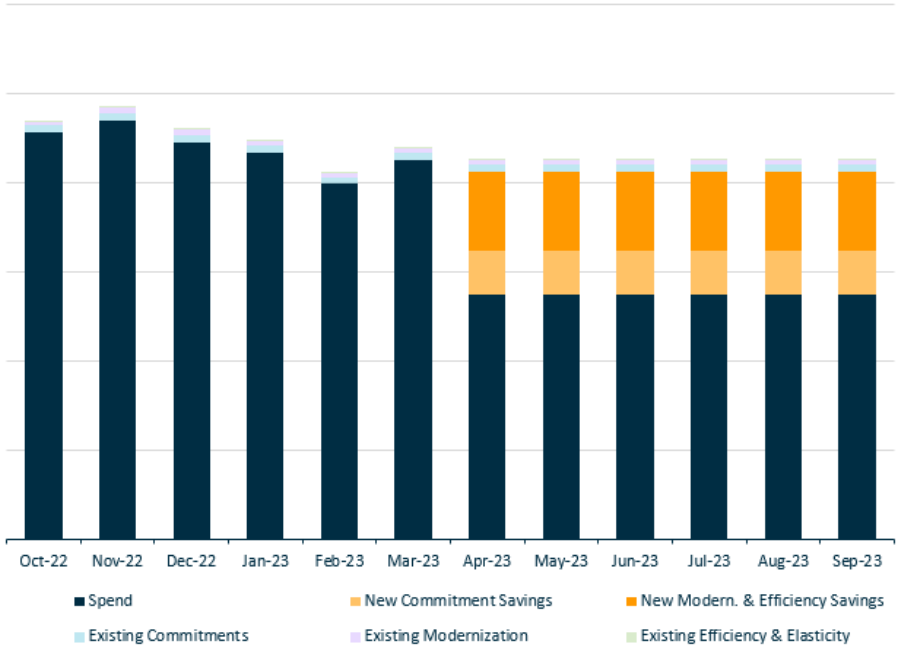
Test-run time cut to 10 minutes, from up to 2 hours (Yelp)

5M financial investment policies recalculated in minutes instead of overnight (ABSI)

Cost Management for AWS Users

Savings potentials for an existing AWS customer

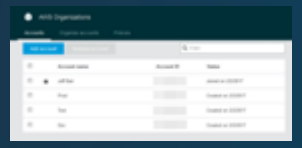
potential monthly saving	potential saving vs monthly spend	savings already achieved	top opportunity	select Saving Plan/RI options
	33.06%		New Savings Plans and Reserved Instances	One Year No Upfront



	previous month	max potential savings
COMMITMENTS		
New Savings Plans and Reserved Instances	0.00%	11.33%
Increased utilization of existing commitments	1.90%	0.00%
MODERNIZATION		
Adopting Graviton2 or latest instance families	0.76%	9.55%
Modernizing to latest EBS volumes generation	1.12%	0.06%
EFFICIENCY & ELASTICITY		
Rightsizing EC2 Environment	0.00%	7.56%
Stopping EC2 & RDS instances at weekends	0.12%	3.80%
Utilizing Spot Instances	0.00%	0.00%
Adopting S3 & EFS Storage Lifecycle	0.29%	0.81%
Other Opportunities		
TOTAL	3.30%	33.06%
POTENTIAL FURTHER AREAS OF INVESTIGATION		
Migrating EC2 & RDS environment to a cheaper region	0.00%	4.66%

Cloud Financial Management

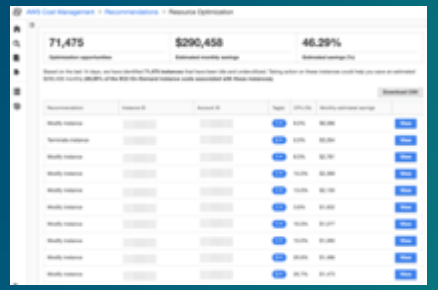
AWS Organizations



AWS Cost Allocation Tags

AWS Cost Explorer

AWS Cost Explorer (EC2 Rightsizing Recommendations)



AWS Budgets

AWS Cost Anomaly Detection

1. CFM ownership
Identify an owner (individual or team) responsible for driving cloud financial management activities

2. Organizational partnership
Create a Finance and Technology partnership and establish a regular communication cadence to create and maintain alignment

3. Cost allocation
Implement an account structure, and tagging strategy to allow allocation of cost to lines of business, products or teams

4. Cost visibility
Report cloud costs to Technology teams in order to raise cost awareness, and establish efficiency KPIs for finance and business stakeholders

5. Cost optimization
Use services and tools to identify and implement cost savings opportunities

6. Cost forecasting and monitoring
Improve cost predictability and monitor spend variances

Continuous: Education
Identify cloud-focused training offerings from AWS Training and Certification to eliminate knowledge blind spots for stakeholders

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Lyft Increases Cost Visibility to Cut Costs by 40% in 6 Months

Challenge

Lyft's annual rides grew from 53 million in 2015 to 160 million in 2016, and rides more than doubled in 2017. This growth led to increased AWS usage, which presented financial management challenges.

Solution

Lyft created a data pipeline that uses the AWS Cost and Usage Report, AWS APIs, and Lyft-specific data sources to create self-service dashboards that provide high-level metrics for business leaders and more detailed information for developers.

Benefits

- Reduced costs per ride by 40% in 6 months
- Delivered detailed cost metrics
- Reduced waste and verified spend decreases
- Allowed engineers to build new tools and save money

> "We achieved high ROI by starting small and enabling baseline visibility. This work allowed us to better understand our AWS footprint at a high level."
>
> – Engineering Manager, Capacity Team, Lyft

https://aws.amazon.com/solutions/case-studies/lyft-cost-management/

Company:	Lyft
Industry:	Transportation and Logistics
Country:	United States
Employees:	5,380
Website:	lyft.com

About Lyft

Lyft is a ridesharing company based in San Francisco, California. Lyft operates in 644 cities in the US and 12 cities in Canada. The company develops, markets, and operates the Lyft mobile app, offering car rides, scooters, a bicycle-sharing system, and a food-delivery service.

MicroStrategy Uses Governance to Cut Cloud Costs by 30%

Challenge

As MicroStrategy began investing more in the cloud, it sought to control its growing AWS costs. To support a new initiative, MicroStrategy wanted to reduce its overall cloud spend by 20 percent year-over-year.

Solution

MicroStrategy used AWS Cost and Usage Report and its own internal analytics to optimize AWS usage. The company also designed and implemented an organizational hub-and-spoke model for Cloud Financial Management.

Benefits

- Reduces cloud spend by 30% year-over-year
- Saves $250,000 annually
- Drives better internal visibility into cloud usage and spend
- Delivers 50% more training environments

> Using the AWS Cost and Usage Report and our own analytics, we provided more transparency around cloud spend. Our notifications definitely helped create more cost-aware consumption.

– Clayton Myers, Vice President of Technology, MicroStrategy

https://aws.amazon.com/solutions/case-studies/microstrategy-cost-management/

Company:	MicroStrategy
Industry:	Professional Services
Country:	United States
Employees:	2,259
Website:	microstrategy.com

About MicroStrategy

MicroStrategy, the largest independent, publicly traded business intelligence company, offers a leading enterprise analytics platform. MicroStrategy provides modern analytics on an open, comprehensive enterprise platform used by many brands in the Fortune Global 500.

Thank you!

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