PUBLIC SECTOR SUMMIT ONLINE

Understanding optimizing costs with the AWS Cloud

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aws PUBLIC SECTOR SUMMIT ONLINE

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Agenda

- The AWS difference – from a financial perspective
- Working backwards – two customer success stories
- Total Cost of Ownership (TCO)
- TCO and cost optimization in the AWS Cloud

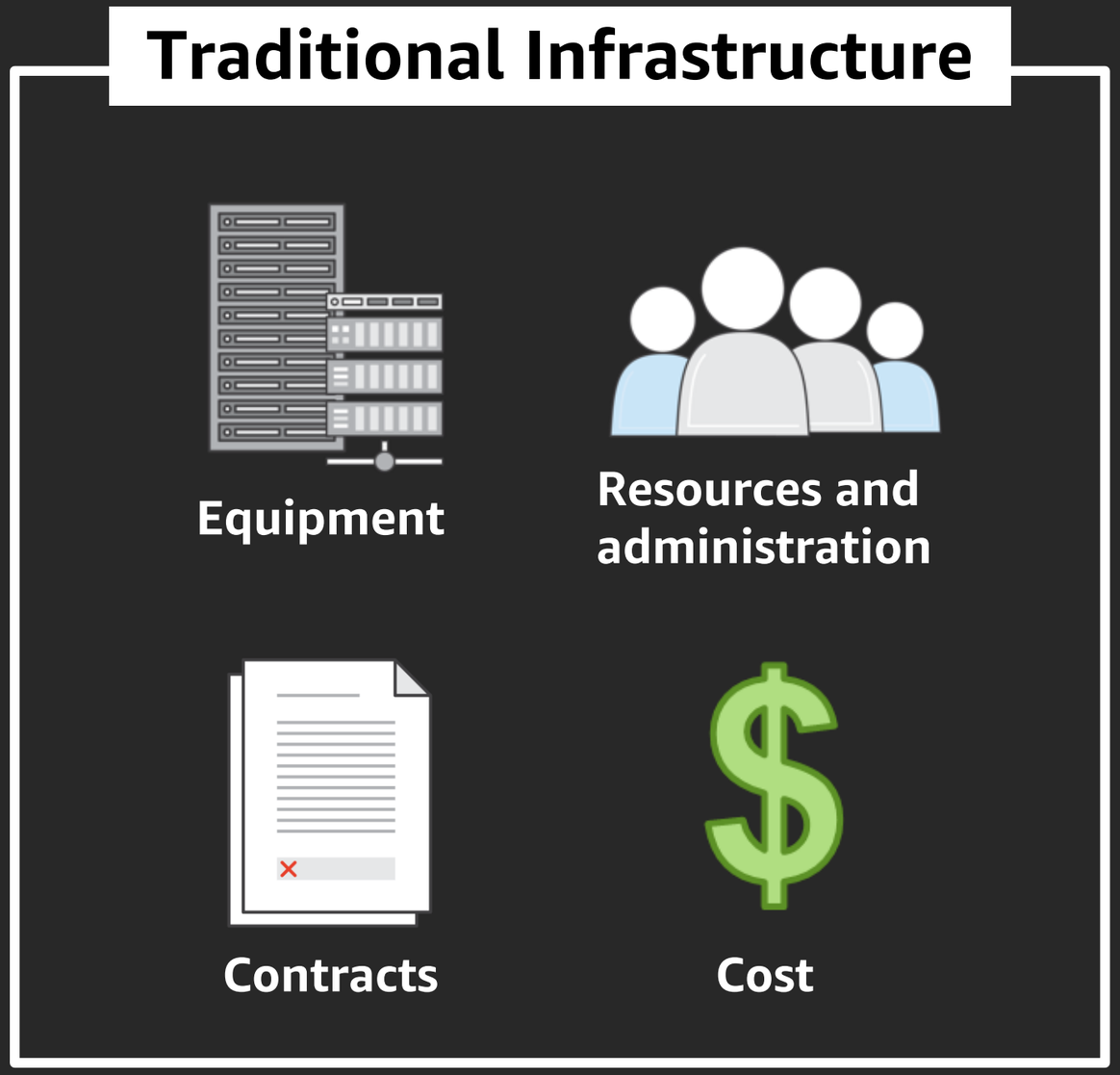
The AWS difference – from a financial perspective

What sets AWS apart?

Experience	Building and managing cloud since 2006
Service Breadth and Depth	175+ services to support any cloud workload
Global Footprint	76 Availability Zones across 24 regions, 216 points of presence
Partners	Thousands of consulting and technology partners, 7,000+ AWS Marketplace products in 39 categories
Pricing Philosophy	80 proactive price reductions to date*

* As of Feb 6, 2020

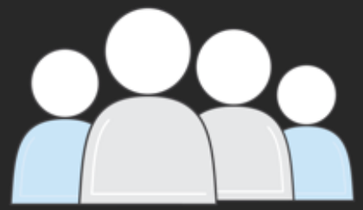
Why choose AWS over traditional infrastructure?



Why choose AWS over traditional infrastructure?

Traditional Infrastructure

Equipment



Resources and administration

Contracts

Cost

AWS Cloud

No up front expense – pay for what you Use

Improve time to market and agility

Scale up and down

Self-service infrastructure

Working backwards – two customer success stories

Municipal Property Assessment Corporation (MPAC)

> AWS has had a transformational effect on our business, enabling us to serve our business clients better and faster than we ever have before.
>
> **– Nicole McNeill, Chief Financial Officer**

MPAC is the largest assessment jurisdiction in North America, responsible for accurately assessing and classifying more than five million properties in Ontario.

- Public sector organization evaluates 5M+ properties across Ontario for use in assessing $30B+ in property taxes
- Formerly 95% “keep the lights on” and 5% innovation
- Migrated off traditional IT architecture to AWS for greater speed and agility
- Main valuation engine now runs 5,000% faster at 1/10th the cost of previous architecture
- Developers release new features every one to two weeks instead of every three to six months as in the past
- Started with a purchasing card at a spend of $50-100/month

Financial Industry Regulatory Authority (FINRA)

> For our market surveillance systems, we are looking at about 40% (savings with AWS), but the real benefits are the business benefits. We can do things we physically weren't able to do before and that is priceless.
>
> **– Steve Randich, Chief Information Officer**

FINRA is the largest independent regulatory authority in the United States. It is based in Washington, DC.

- Wanted a platform to provide greater speed and scalability for analyzing petabyte-scale data
- Migrating mission-critical operations to AWS
- Can provide analysts with real-time access to 75 billion records collected daily
- Can move faster and more efficiently in serving core business processes
- Estimated savings of $10-20m annually by using AWS

Total Cost of Ownership (TCO)

Comparing TCO isn't easy

***Comparative* TCO analysis** (acquisition and operating costs)
for running an infrastructure environment end-to-end on premises vs. AWS

Traditional data center
and co-location

≠

aws

TCO considerations include ALL of the following

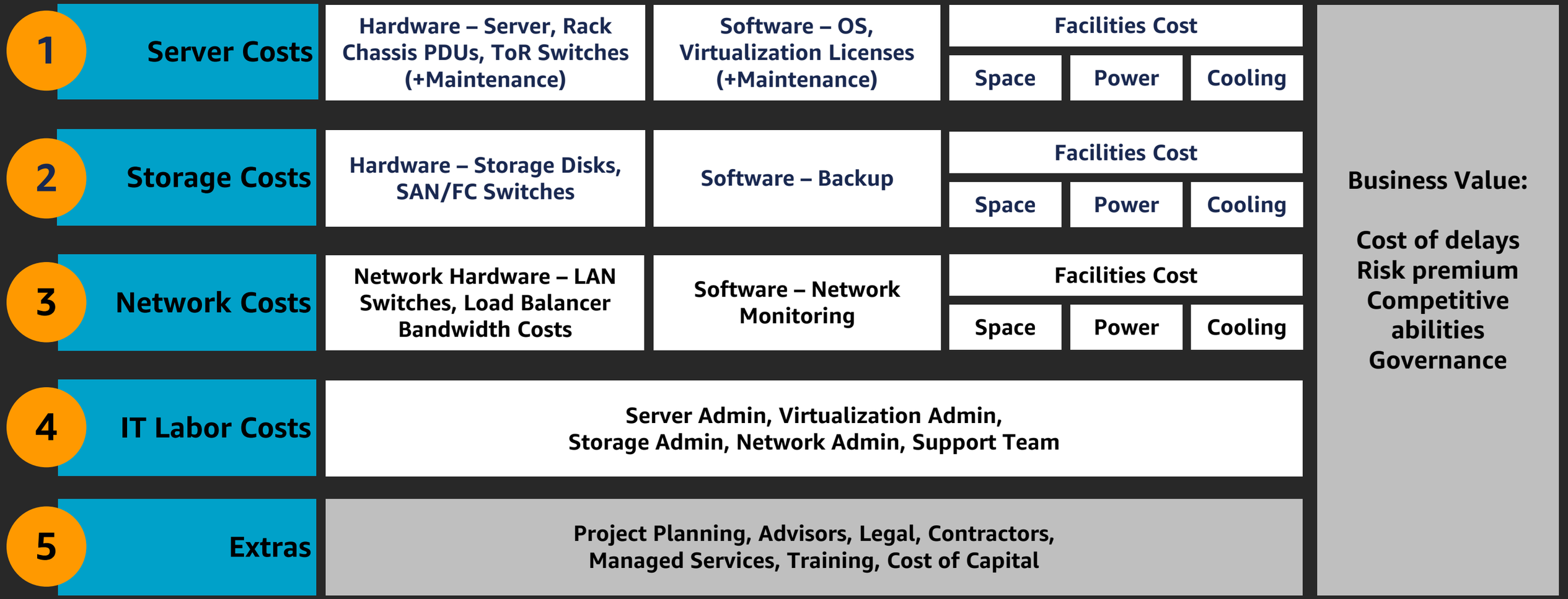


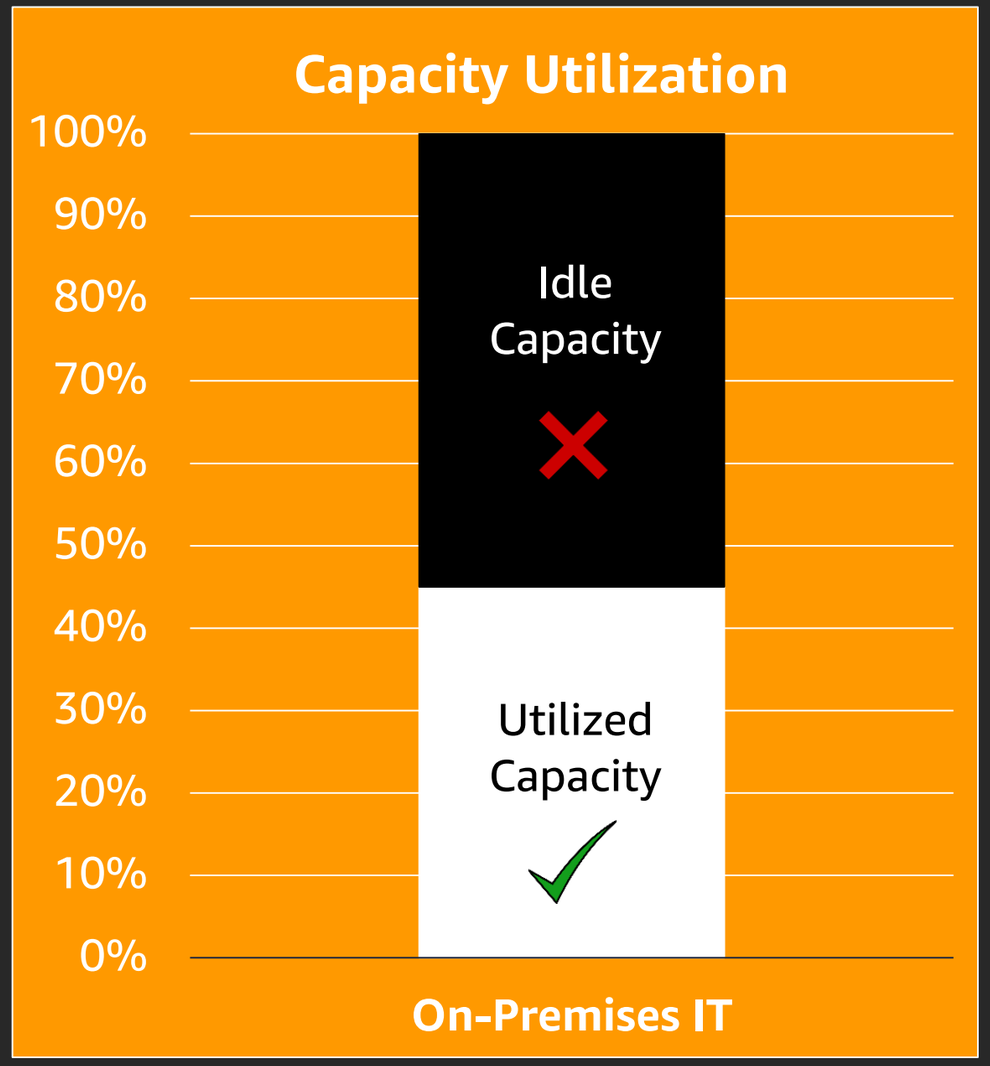
Diagram doesn't include every cost item. Software costs can include database, management, and middle tier software costs. Facilities cost can include costs associated with upgrades, maintenance, building security, taxes, etc. IT labor costs can include security admin and application admin costs.

What's included (or not) in a typical TCO analysis?

Economic Criteria	Category
Infrastructure Comparison	✓
Cost Avoidance	✓
Workforce Productivity	✓
Capacity Planning Benefits	✗
Financial Benefits of Innovation	✗
Accelerated Time To Value/Market	✗
Cost to Achieve (Migration, Platform, Training)	✗
Legacy Constraints	✗

✓ Included ✓ Partially Included ✗ Not Included

On-premises infrastructure is typically under utilized



A typical on-premises compute environment is massively under utilized

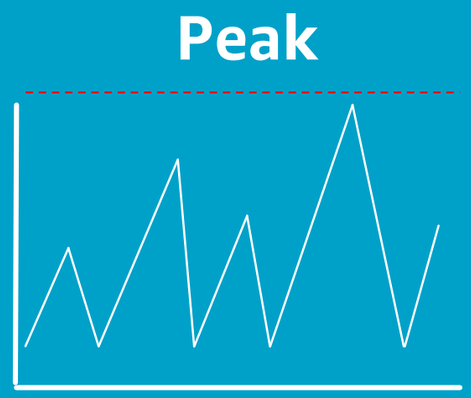
Studies by Gartner, McKinsey, and the Uptime Institute have stated that typical data centers are on average ***less than 50% utilized***

www.uptimeinstitute.org
anthesisgroup.com/wp-content/uploads/2014/08/Data-Center-Issue-Paper-final826.pdf
www.nytimes.com/2012/09/23/technology/data-centers-waste-vast-amounts-of-energy-belying-industry-image.html

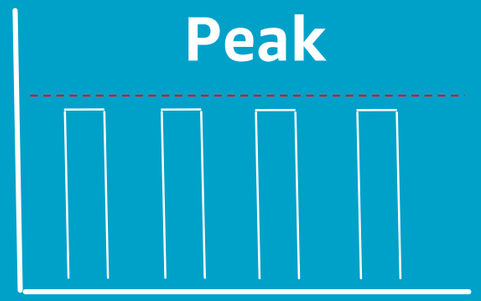
Why is on-premises infrastructure so under utilized?

Part of this can be explained by buying for "peak load" requirements with inflexible infrastructure

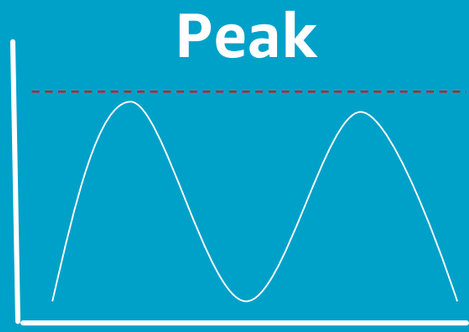
Fluctuating/"Spiky"



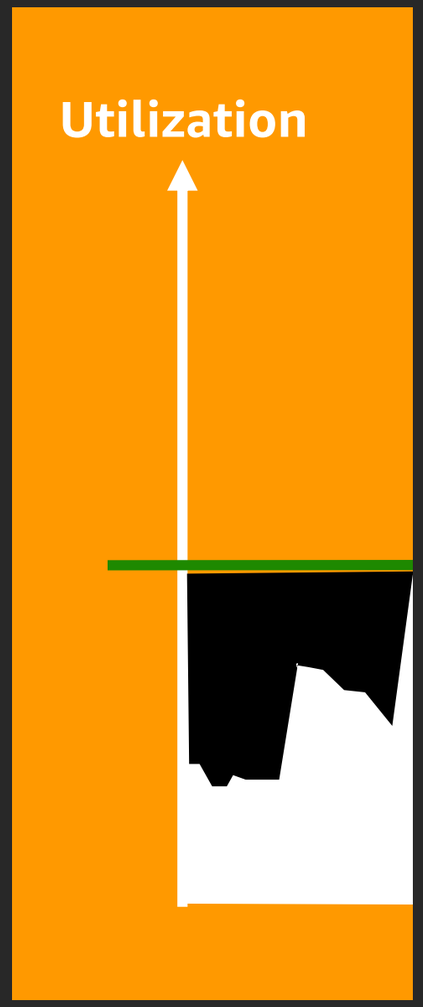
Part-time



Cyclical



Why is on-premises built for peak?



Utilized Capacity

Idle Capacity = Wasted $

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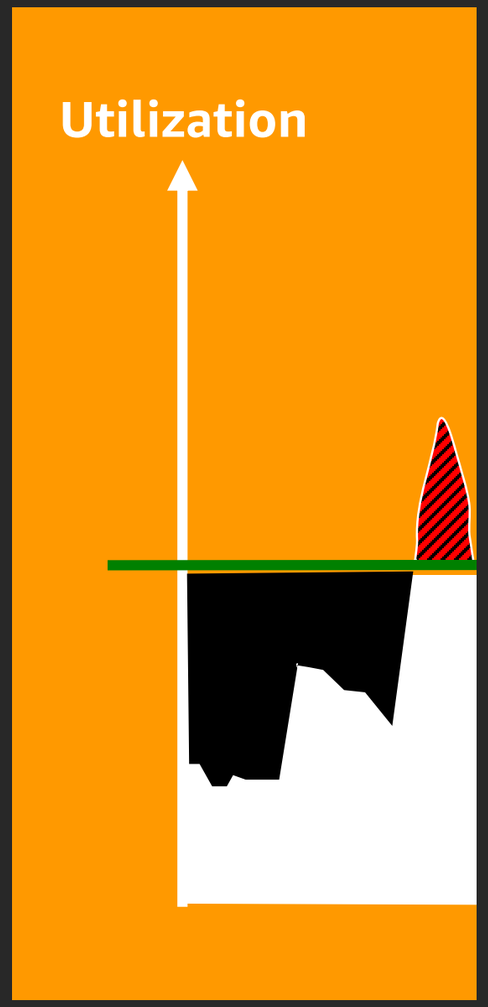

Utilized Capacity

Idle Capacity = Wasted $

OUTAGE!

Downtime

Lost Customers, Citizens, Students

Lost Service Opportunity

Lost Confidence, Trust, Interest

Lost Revenue

(… Impossible to measure)

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Idle Capacity = Wasted $

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More Wasted $

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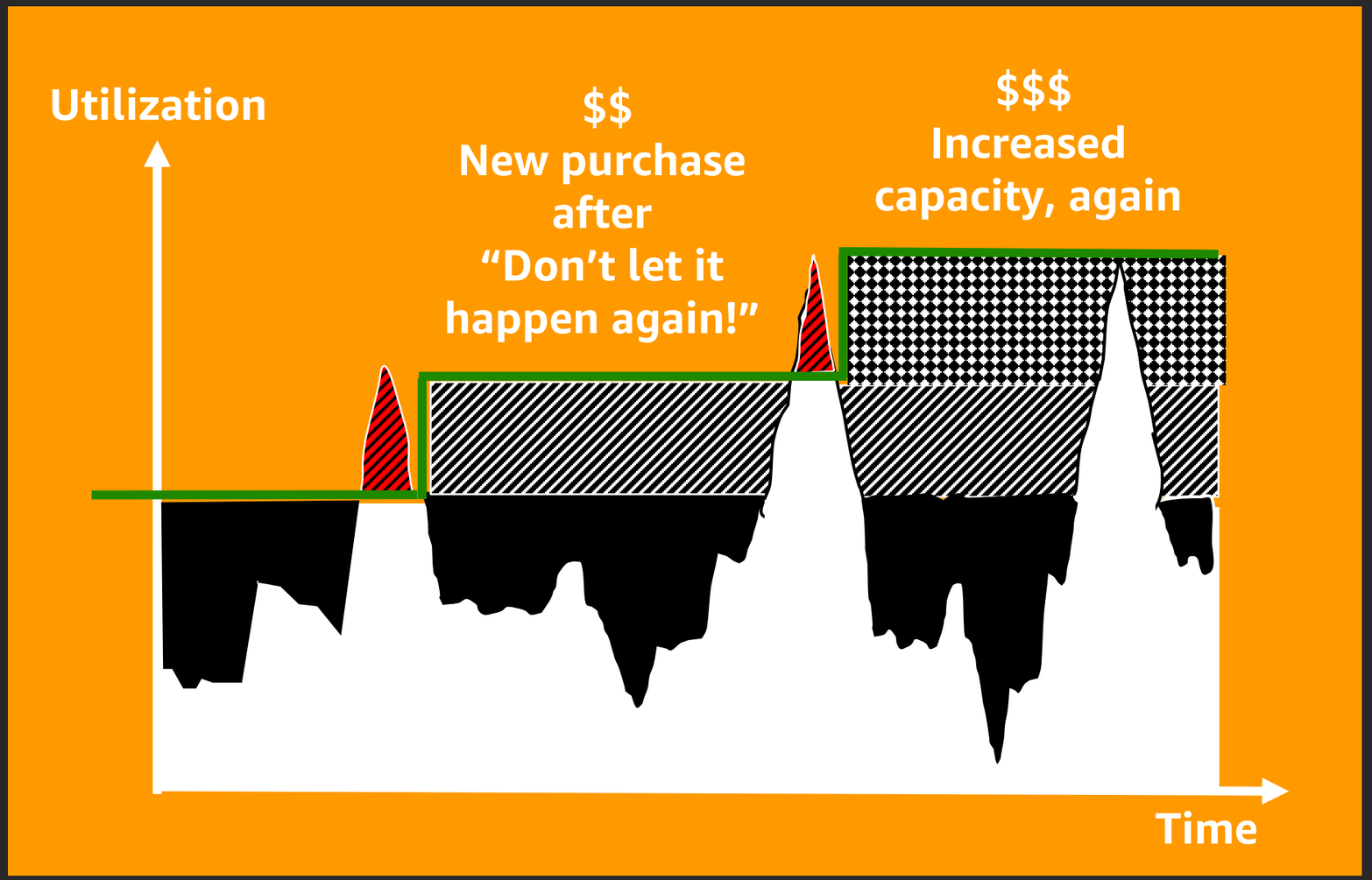

Utilized Capacity

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(… Impossible to measure)

More Wasted $

Yet More Wasted $

Questions to consider when exploring your TCO

1. **Capacity Planning**
   - How do you plan for capacity?
   - How many servers have you added in the past year? Anticipating next year?
   - Can you switch your hardware on and off and only pay for what is used?
2. **Utilization**
   - What is your average server utilization?
   - How much do you overprovision for peak load?
3. **Operations**
   - Will you run out of data center space some time in the future?
   - What was your last year power utility bill for the data center(s)?
   - Have you budgeted for both average and peak power requirements?
4. **Optimization**
   - Are you on AWS today?
   - Is your architecture cost optimized (Auto Scaling, Reserved Instances, Spot, Instances turn on/off)?

TCO and cost optimization in the AWS Cloud

How does AWS help customers reduce their TCO?

Remove over-provisioning and move to a pay-for-what-you-use model

Save more money as you grow bigger:

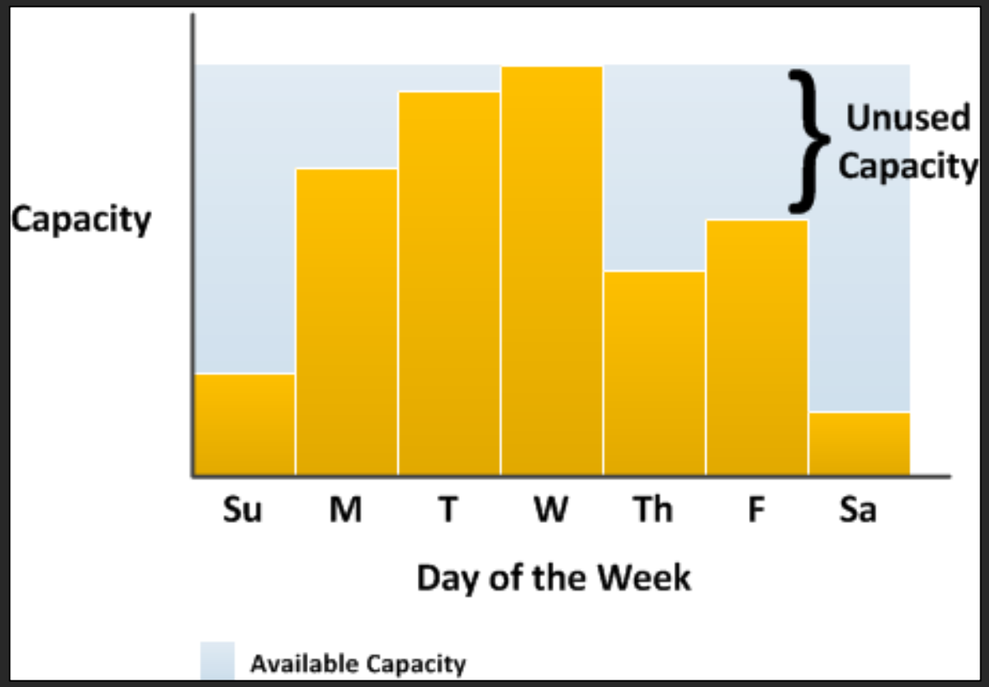
- Tiered pricing
- Volume discounts

Economies of scale allow AWS to continually lower costs

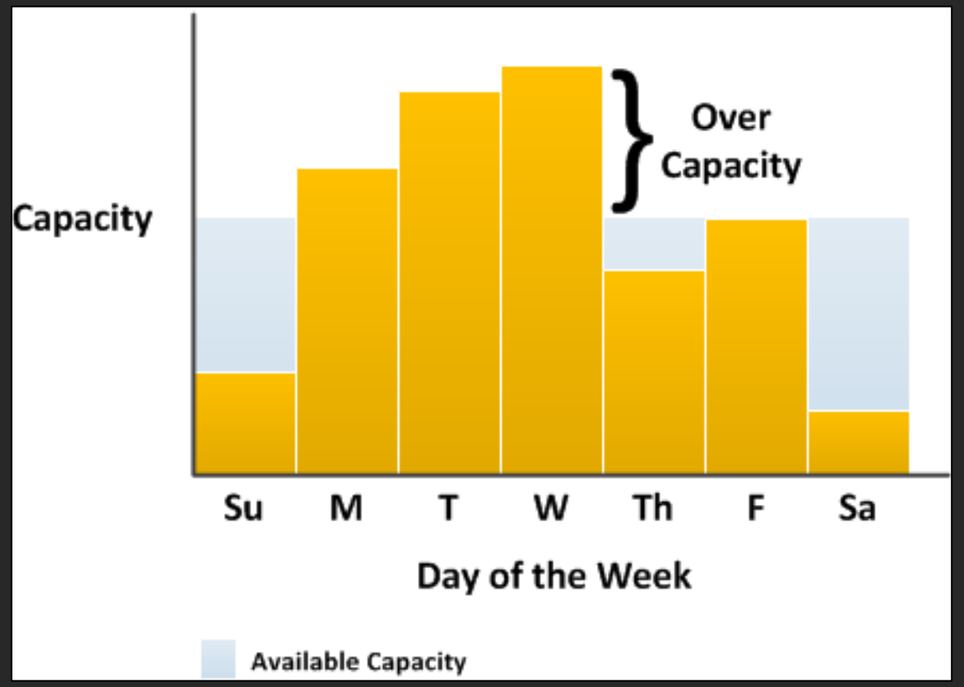
Pricing model choice to support variable and stable workloads:

- On Demand
- Reserved Instances
- Spot Market

Traditional approaches to capacity management



Build to peak load

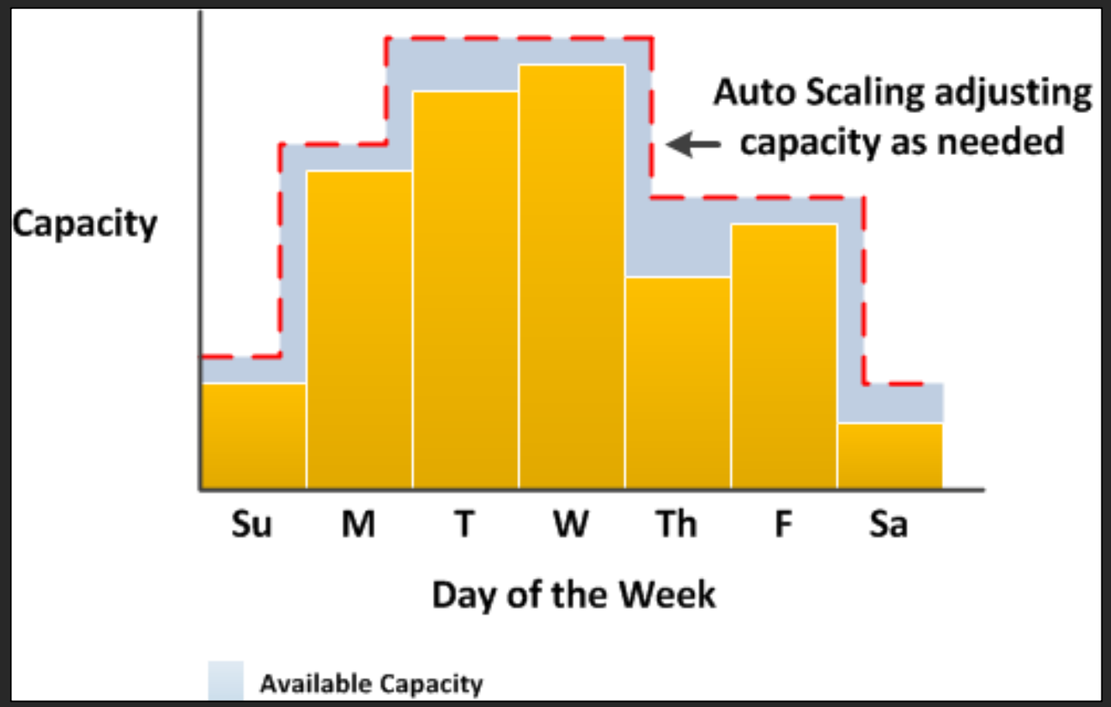


Build to average load

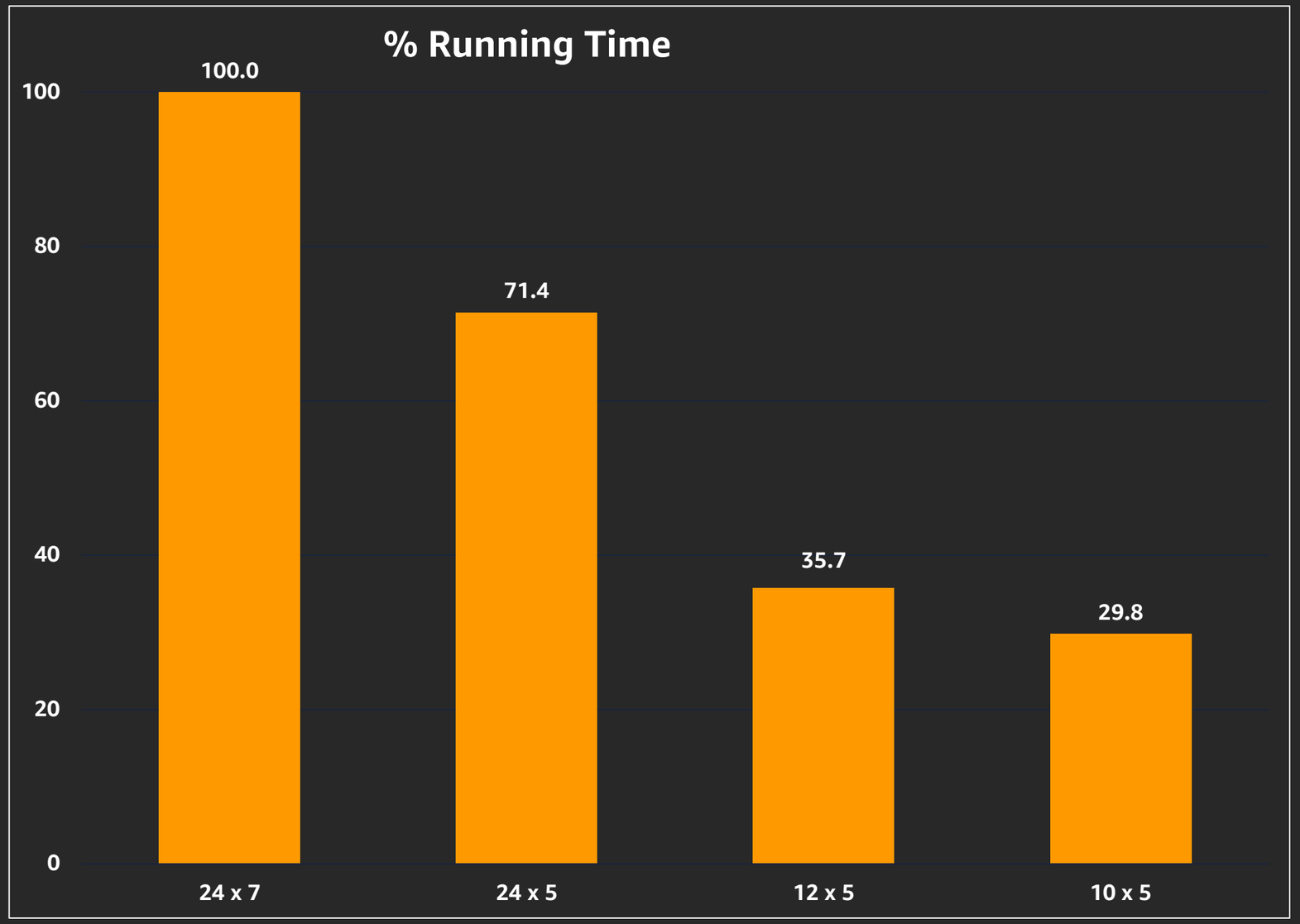
Reduce over-provisioning via elasticity

AWS Auto Scaling allows you to:

- Reduce over-provisioning
- React dynamically to changes in load
- Schedule regular workloads
- Optimize your instance usage
- Complimentary service



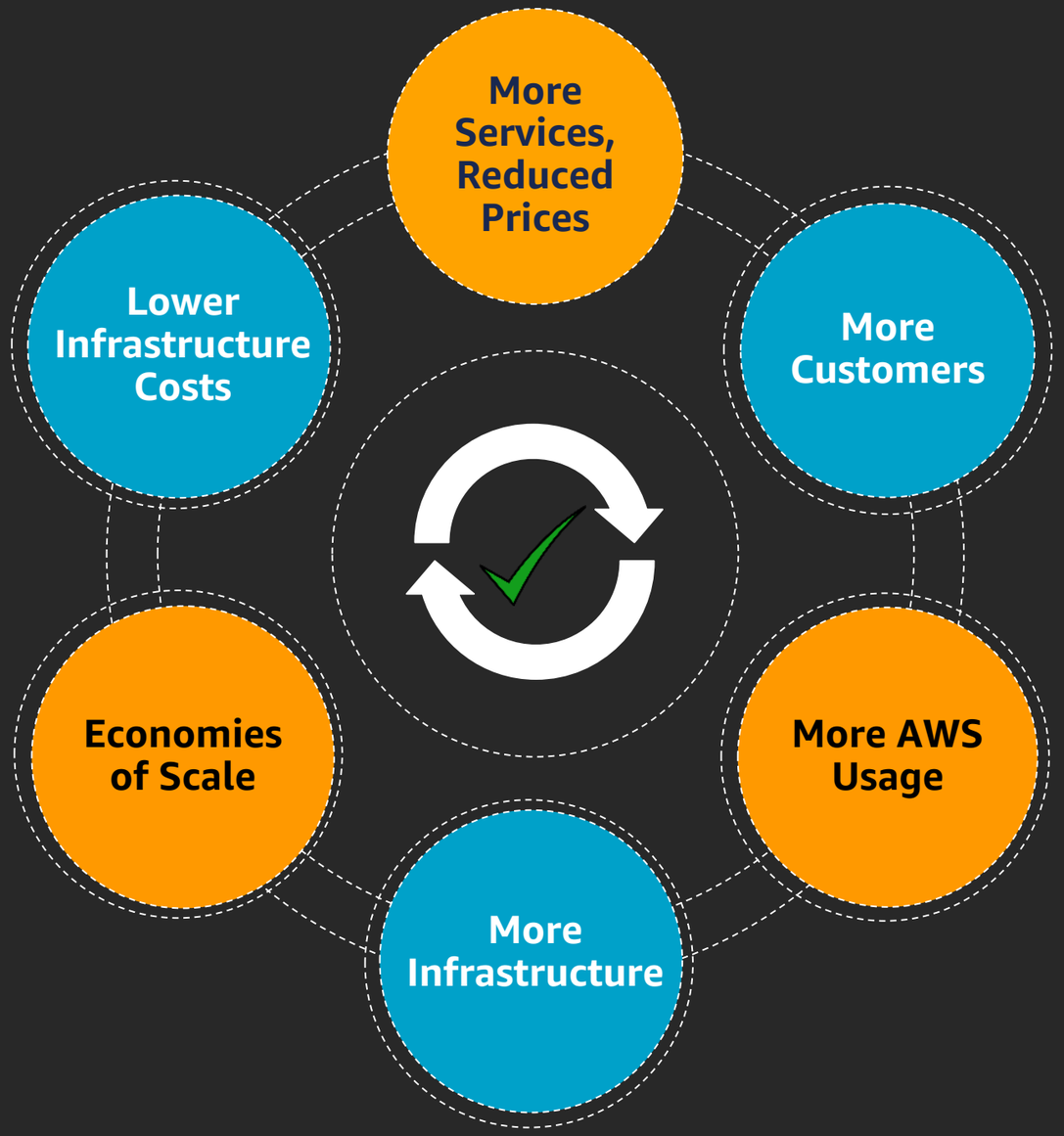
Schedule your workloads



Up to **70%** savings for non-production workloads

Use AWS Instance Scheduler or a partner solution

Benefit from AWS economies of scale



Infrastructure
Innovation

Community
Global footprint
New features
New services

We pass the savings along to our customers in the form of low prices and continuous reductions

(80 price reductions to date – continuously lowering prices for customers is in our DNA)

Select the appropriate Amazon EC2 pricing model

On Demand

Reserved Instances

Capacity reservation… and up to 75% savings vs. On Demand pricing

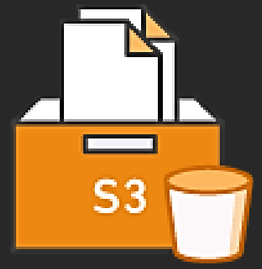
Spot Market

Bid on AWS spare capacity… Up to 90% savings vs. On Demand pricing

Receive volume-tiered pricing discounts (e.g. Amazon S3)

First 50 TB/month

$0.025 GB/month



Next 450 TB/month

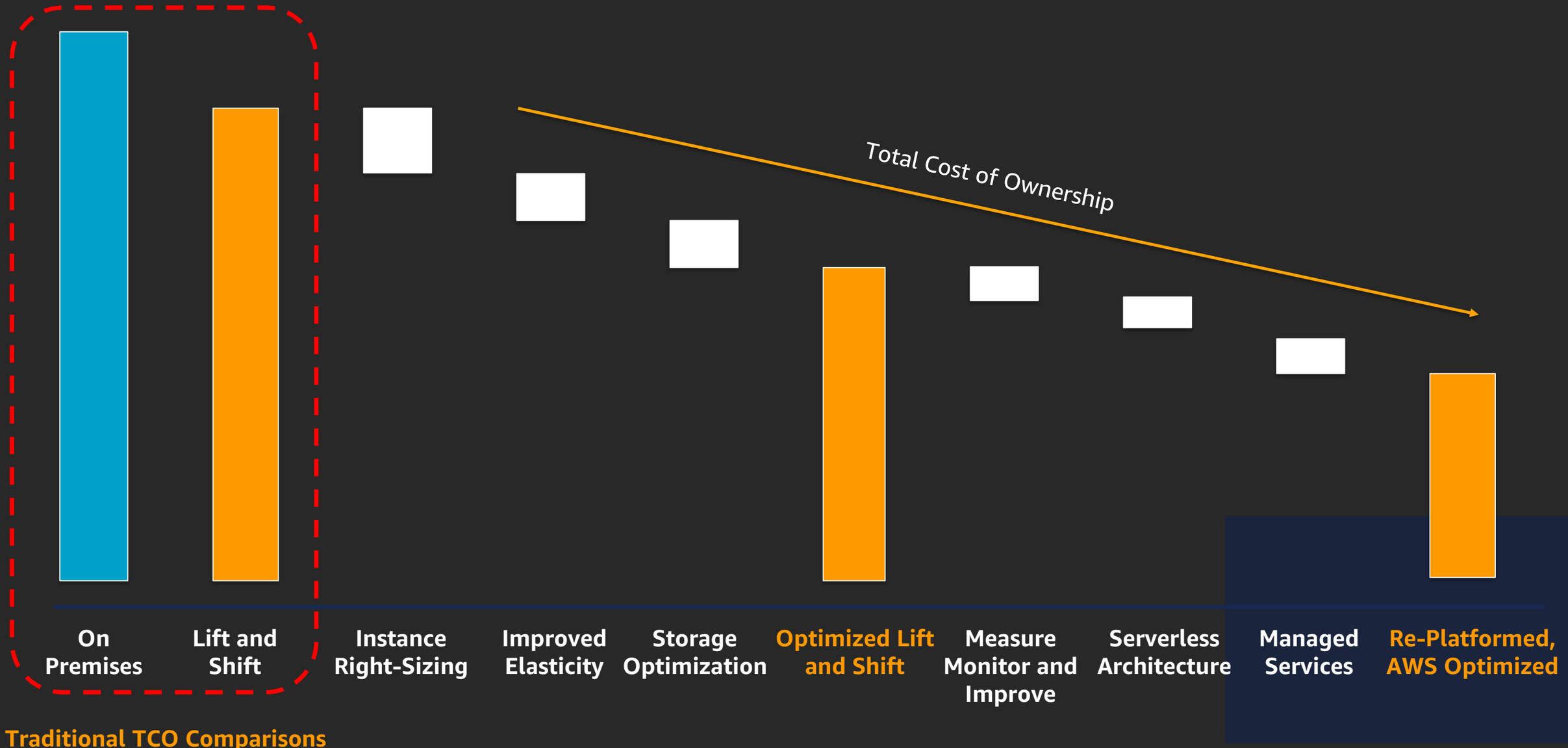
$0.024 GB/month

Over 500 TB/month

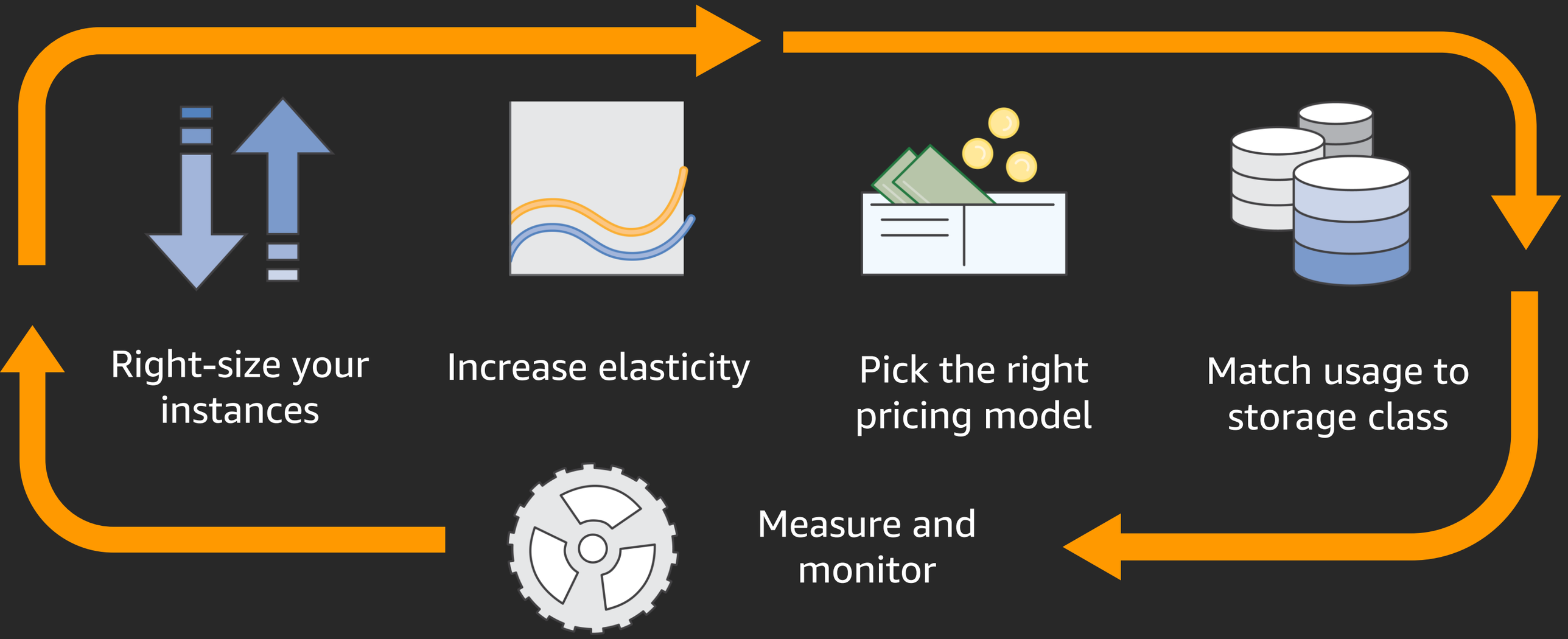
$0.023 GB/month

*Example based on Canada (Central) Region

Economic cost improves through optimization



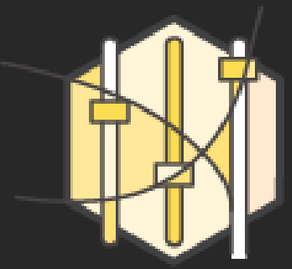
Five pillars of cost optimization in the AWS Cloud



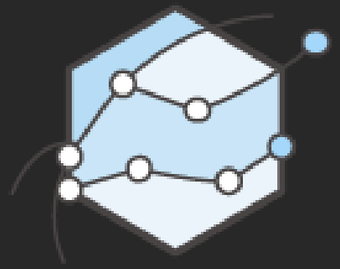
Monitor your workloads

Monitor AWS Resources

Set Alarms



Monitor Custom Metrics



View Graphs and Statistics

Monitor and React to Resource Changes

Amazon CloudWatch **AWS Trusted Advisor** **AWS Cost Explorer**

Useful resources

AWS Pricing

- https://aws.amazon.com/pricing

Online TCO Calculator

- https://awstcocalculator.com

AWS Cloud Economics Centre

- https://aws.amazon.com/economics

Learn to build cloud fluency in your organization

Resources created by the experts at AWS to help you build the skills you need

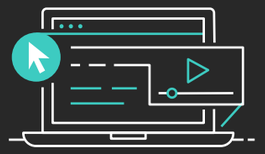
Cost Savings (TCO)

Staff Productivity

Operational Resilience

Overall Agility

Be ready for global cloud transformation with comprehensive skill development



Digital Training

Classroom Training

AWS Certification

Talent Pipeline

Visit **https://aws.amazon/training**

Thank you!

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