

# Total cost of ownership (TCO)

AWS CLOUD CONCEPTS



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# AWS cloud value framework

## Cost Savings (TCO)

### What is it?

Infrastructure cost savings/ avoidance from moving to the cloud.

## Staff Productivity

### What is it?

Efficiency improvement by function on a task-by-task basis.

## Operational Resilience

### What is it?

Benefit of improved availability, security, and compliance.

## Business Agility

### What is it?

Deploying new features/ applications faster and reducing errors

# Total cost of ownership (TCO)

- The cost of owning and operating servers and data centers (for cloud vs on-premises cost comparison)
- Moving to the cloud **introduces a new cost structure**, including:
  - Compute
  - Storage
  - Networking
- And **eliminates on-premises related costs**, such as:
  - Space
  - Power
  - Cooling
  - Physical security

# Economies of scale



In microeconomics, **economies of scale** are the cost advantages that enterprises obtain due to their scale of operation - *Wikipedia*

- Reduced data center costs due to **massive investments** from AWS
- Important **CapEx (Capital Expenditures) reduction** compared to on-premises configurations

# Optimizing costs

- Leverage the **pay as you go** model
  - Allocate the necessary resources only
  - Deallocate resources when they become unnecessary
- Leverage the different **pricing plans**
  - Adapted to the use case
  - E.g. renting crucial virtual machines for long periods vs. on-demand
- Use AWS **managed services**
  - E.g. using Amazon Aurora for relational databases or Amazon Redshift to host data warehouses is 10x less costly than on-premises alternatives.

# Measuring cost optimization

- Tools:
  - AWS Cost Explorer
  - AWS Cost and Usage Report
  - AWS Budgets
- Resource costs comparison:
  - Cloud vs. on-premise
  - Optimization on the cloud (ex: most adapted tools, leveraging pricing plans, etc)
- Average IT infrastructure spend per user

# Average cost savings on AWS

Overall spend per user

**27%**

Reduction in **overall  
spend per user**

Decreases as customers mature  
and scale on AWS

**42%**

Reduction in **overall  
spend per mature user**

**12%**

**Lower on AWS**  
vs. multi-cloud customers



# The case of General Electric Oil & Gas



**52% TCO reduction  
after moving 500 applications to AWS  
(2016)**

# The case of CMS

**3x more servers**

**with the same cost vs. on-premises  
(2020)**



# The case of Standard Chartered



standard  
chartered

**60% reduction in computations costs**

**leveraging AWS EC2 Spot (2020)**

# **Let's practice!**

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# Staff productivity

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# On-premises data centers staff efforts

- Planning, acquisition and maintenance of the **physical data center**:
  - Power cabling
  - Telecommunication cabling
  - Ventilation and cooling
  - Electronic security systems
- Continuous **server-related efforts**:
  - Provisioning
  - Monitoring
  - Patching/updating
  - Securing

# Staff productivity on AWS

- Infrastructure **heavy-lifting** performed by AWS
- Development teams focus on:
  - The product
  - Its features
  - The value brought to customers
- Launch and manage **more resources**
- Manage **more important volumes of data**
  - Leveraging Big Data services (DynamoDB, Kinesis...)

# Improve staff productivity

- First productivity jump by migrating to the cloud
- Further improvements by adapting applications to the cloud:
  - Rearchitecting and refactoring
  - Leveraging managed services
- Further improvements by implementing modern development and operations methodologies and tools such as:
  - Agile
  - DevOps
  - Containers

# Measuring staff productivity

- VMs managed per administrator
- Amount of data managed per administrator
- Time of server configuration

# Average staff productivity improvement on AWS

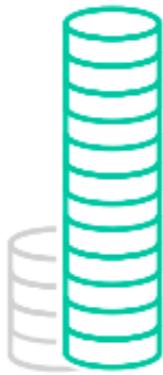
Cloud improves IT efficiency

**68%**  
increase in TB managed per admin



With larger gains for re-architected applications

**154%**  
increase in TB managed per admin



**58%**  
increase in VMs managed per admin



**148%**  
increase in VMs managed per admin



# The case of Sage Group



**500 hours of server configuration  
saved yearly after migrating to AWS**

# The case of Unilever

**75% time to market reduction**

focusing on innovation rather than  
infrastructure



**Unilever**

# The case of the Kellogg Company



**AWS servers deployed in 1 hour  
vs. 8 weeks on-premises**

# **Let's practice!**

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# Operational resilience

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# Operational resilience

- Operational resilience domains (Gartner):
  - Security (cyber and physical)
  - Safety
  - Privacy
  - Continuity of operations
  - Reliability
- Leveraging AWS:
  - Built-in security technology and data encryption (e.g. AWS KMS)
  - Data center redundancy through availability zones
  - Stronger service-level agreement (SLA)

# Improve operational resilience

- Migrating as much components as possible to the cloud to benefit from
  - Physical and virtual security
  - Redundancy
  - etc
- Security alerts using AWS CloudWatch
- Account activity tracking using AWS CloudTrail and regular auditing
- Deployment automation using AWS CloudFormation
- Leverage tools such as AWS CodePipeline for continuous delivery

# Measuring operational resilience

- Application downtime
- Number of overall incidents
- Number of specific incidents
- Content access:
  - Stability of delays
  - Bounce rates
- Failover delays
  - The failover is the ability to **switch to a backup system**.

# Average operational resilience improvement on AWS



**57%**  
Decrease in  
downtime



**32%**  
Decline in **critical**  
**(P1/P0)** incidents



**39%**  
Decrease in **mean time**  
**to restore (MTTR)** from  
**critical (P1/P0)** incidents

# The case of MedStar Health



# MedStar Health

**5 minutes of downtime**

**monthly, instead of 2 hours before  
migrating to the cloud**

**120 ms for page download  
instead of 1.5 seconds on-premises**

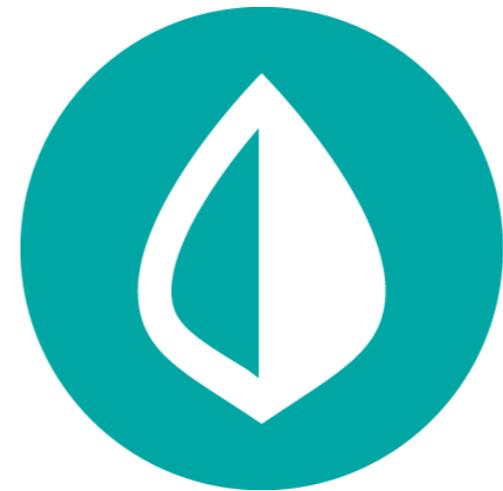
# The case of Intuit Mint

**1 minute for database failover**

**instead of 30 minutes on-premises**

**200% website traffic increase**

**after migrating to AWS**



**intuit<sup>®</sup>**  
**mint<sup>®</sup>**

# The case of Viskase



**~100% SLA**

**after migrating to AWS**

**1 hour to restore SAP solution  
instead of 2 days on-premises**

# **Let's practice!**

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# Business agility

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# Business agility

- Enhancing product development by:
  - Quickly adapting to the market: fast new feature/application deployment
  - Reducing errors
- By leveraging AWS, no need to provision new physical resources to try new ideas:
  - Quick and cost-efficient allocation/deallocation of resources
  - Low cost of failure
  - Better use of innovation budget, more testing and learning

# Improving business agility

- Test new ideas directly on AWS
  - Flexibility
  - Reduced exploration costs
- Immediately shut down resources for inconclusive ideas
  - Reduce the cost of failure
- Encourage teams to explore on the cloud more and escalate problems
- Implement agile methodologies (Agile, DevOps, etc)

# Measuring business agility

- Time to market for new features/applications
- Code deployment frequency
- Time to deploy new code
- Overall time for:
  - Development cycles
  - Data manipulation cycles

# Business agility improvement on AWS



**37%**  
Decrease in  
**time to market**



**343%**  
Increase in **code deployment frequency**

# The case of 3M (Health Information Systems)



**Minutes of server provisioning**  
**instead of 10 weeks on-premises**

**Code deployment every week**  
**instead of once every 6 weeks before**  
**migrating to AWS**

# The case of the National Bank of Canada

**1 minute data manipulation  
processes on AWS**

**took days on-premise**

**Hours of post-trade analytics**

**instead of weeks on-premises**



# The case of MediaTek

The Mediatek logo, featuring the company name in a bold, white, sans-serif font, set against a solid orange rectangular background with rounded corners.

**50% faster development cycle  
after migrating to AWS**

# **Let's practice!**

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