AWSome Day

Location – Date

Presenter
AWS Org

AWS Business Essentials

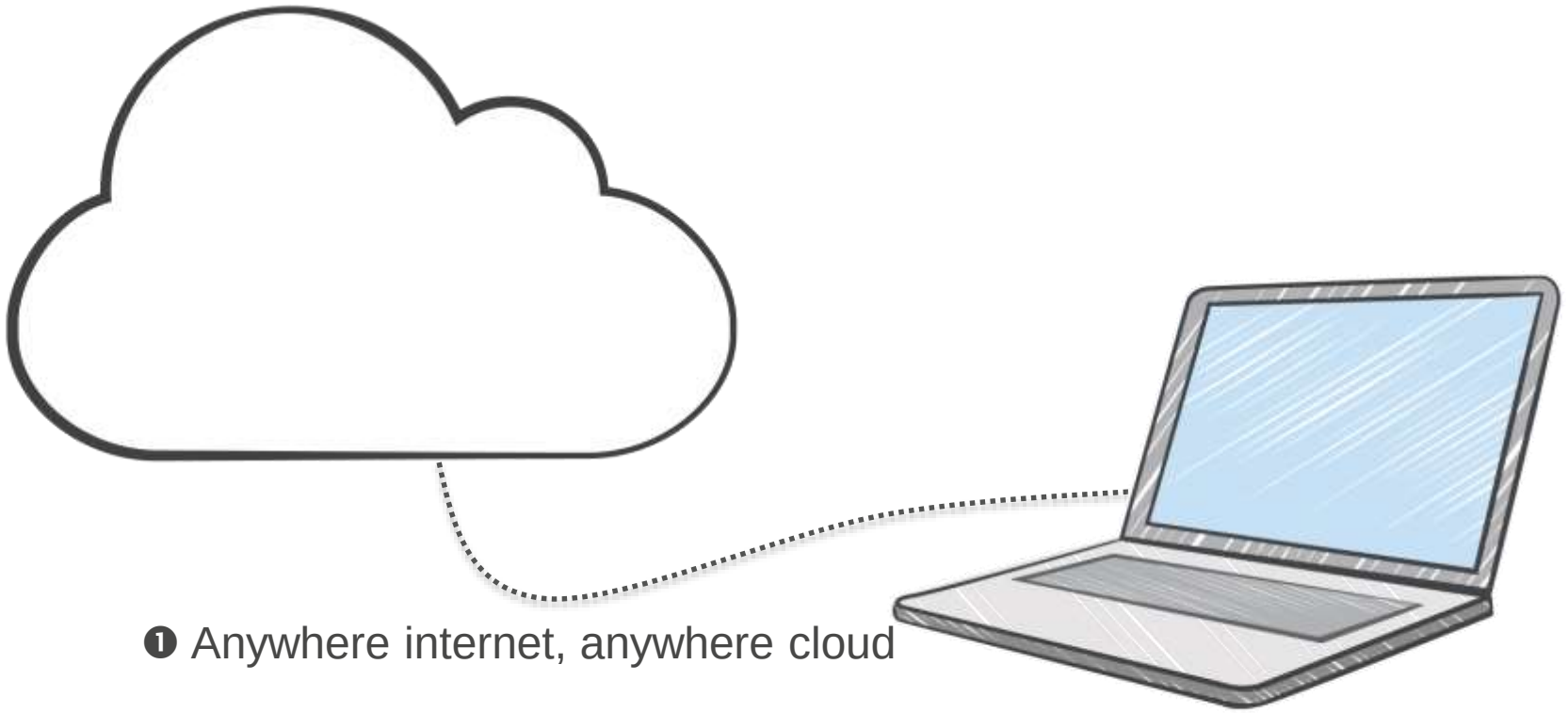
- **Module 1:** Getting Started with the Cloud
- Module 2: Leveraging AWS for Competitive Advantages
- Module 3: Cloud Economics
- Module 4: Security and Compliance
- Module 5: Migrating to the Cloud

What's in Module 1

- What is cloud computing?
- Why do organizations leverage cloud computing services?
- Who is using cloud computing services?

Cloud Computing: the **on-demand** ❹ delivery of **IT resources and applications** ❷

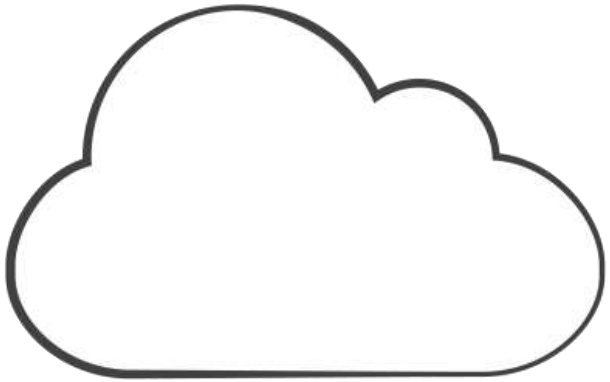
via the Internet ❶, with **pay-as-you-go** ❸ pricing.



❶ Anywhere internet, anywhere cloud

❷ IT Resources and Applications

On-Premises: Physical



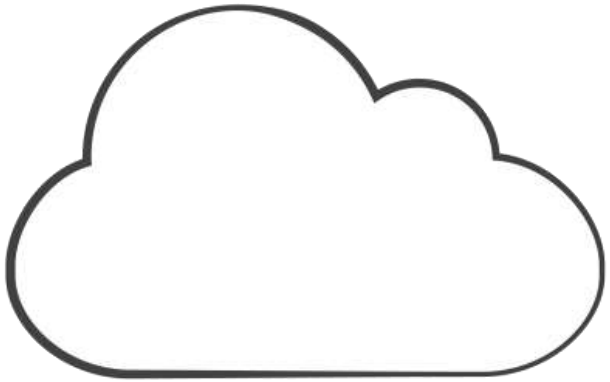
Cloud: Services

- Compute and networking
- Storage
- Database
- Application services
- Deployment and management

❷ IT Resources and Applications

Inflexible

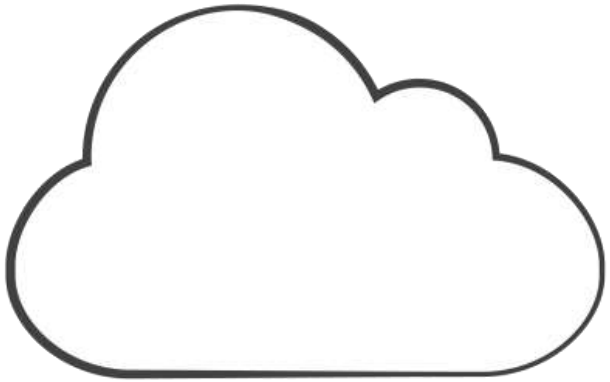
- Large initial purchases
- Labor, patches, and upgrade cycles
- Systems administration
- Fixed capacity
- Procurement and setup
- Limited geographic regions

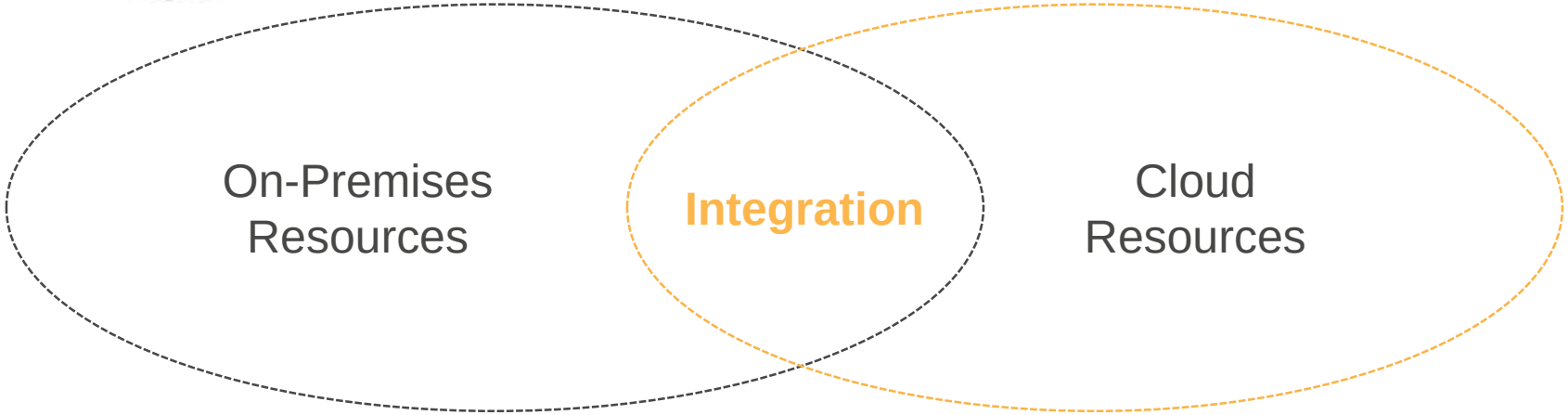


Elastic

- No upfront investment
- Low on-going costs
- Focus on innovation
- Flexible capacity
- Speed and agility
- Global reach on demand

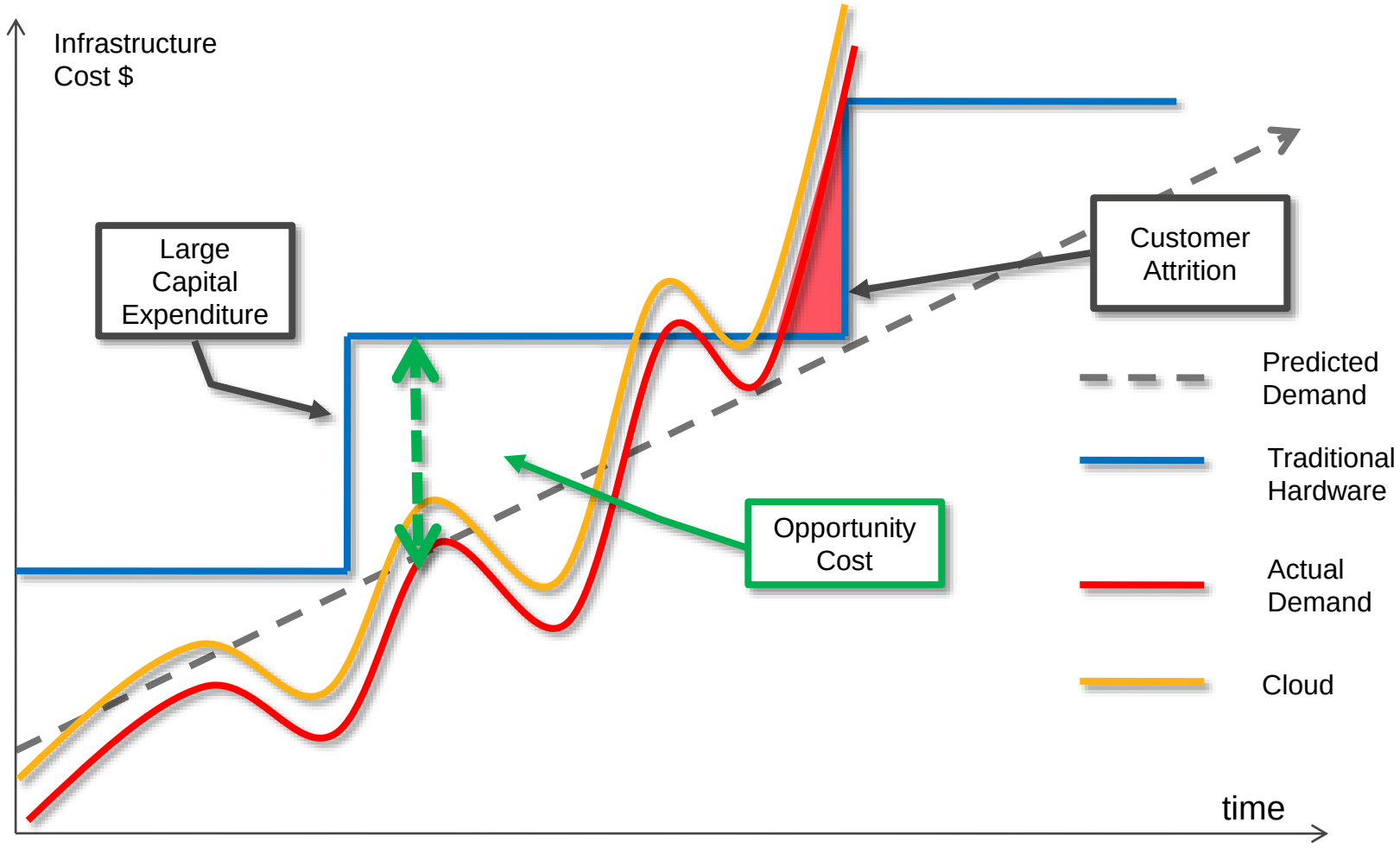
❷ IT Resources and Applications





The Cloud Isn't An "All or Nothing" Choice

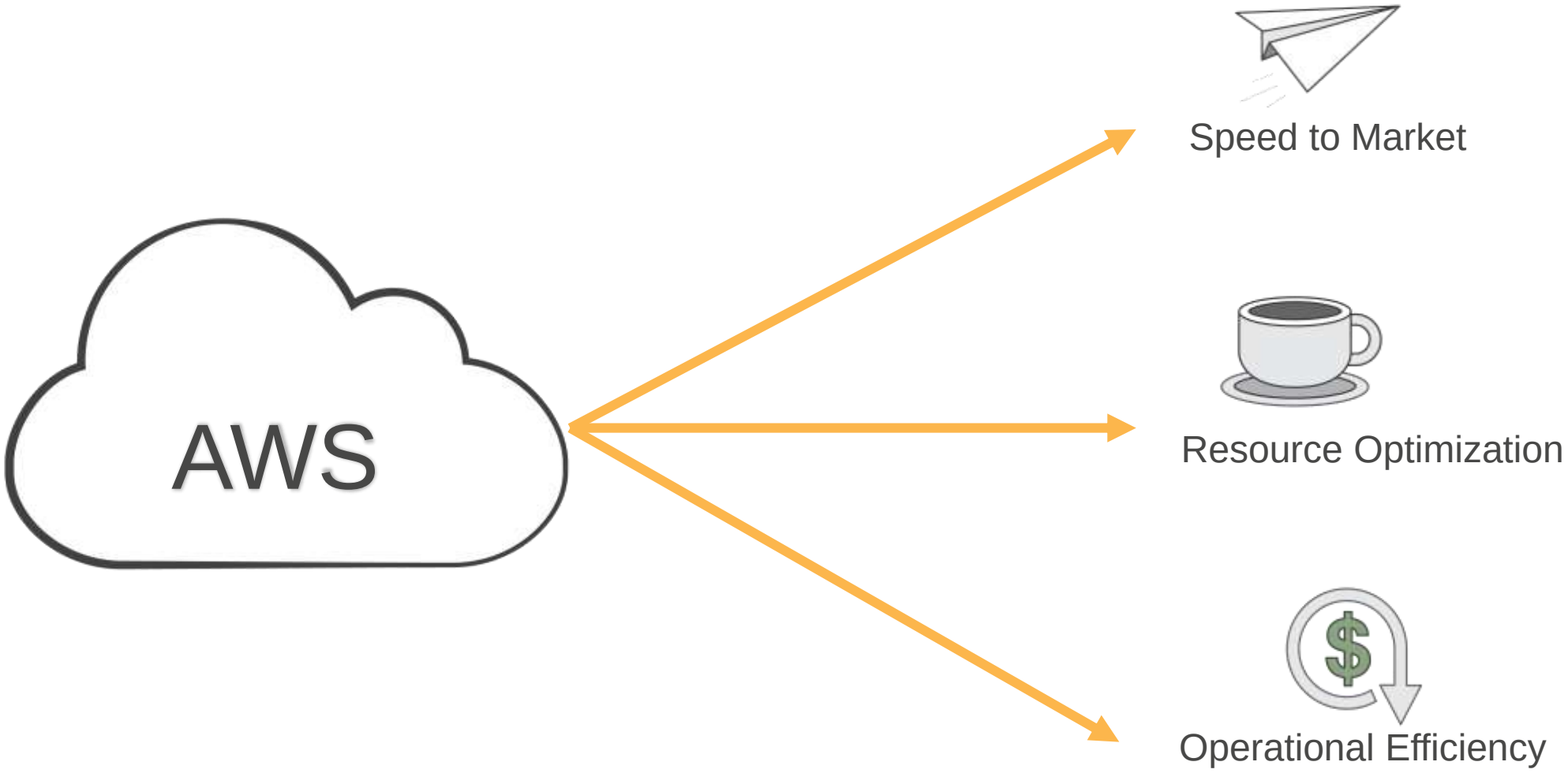
❸ Pay As You Go + ❹ On Demand



What's in Module 1

- What is cloud computing?
- Why do organizations leverage cloud computing services?
- Who is using cloud computing services?

Three Advantages and Benefits



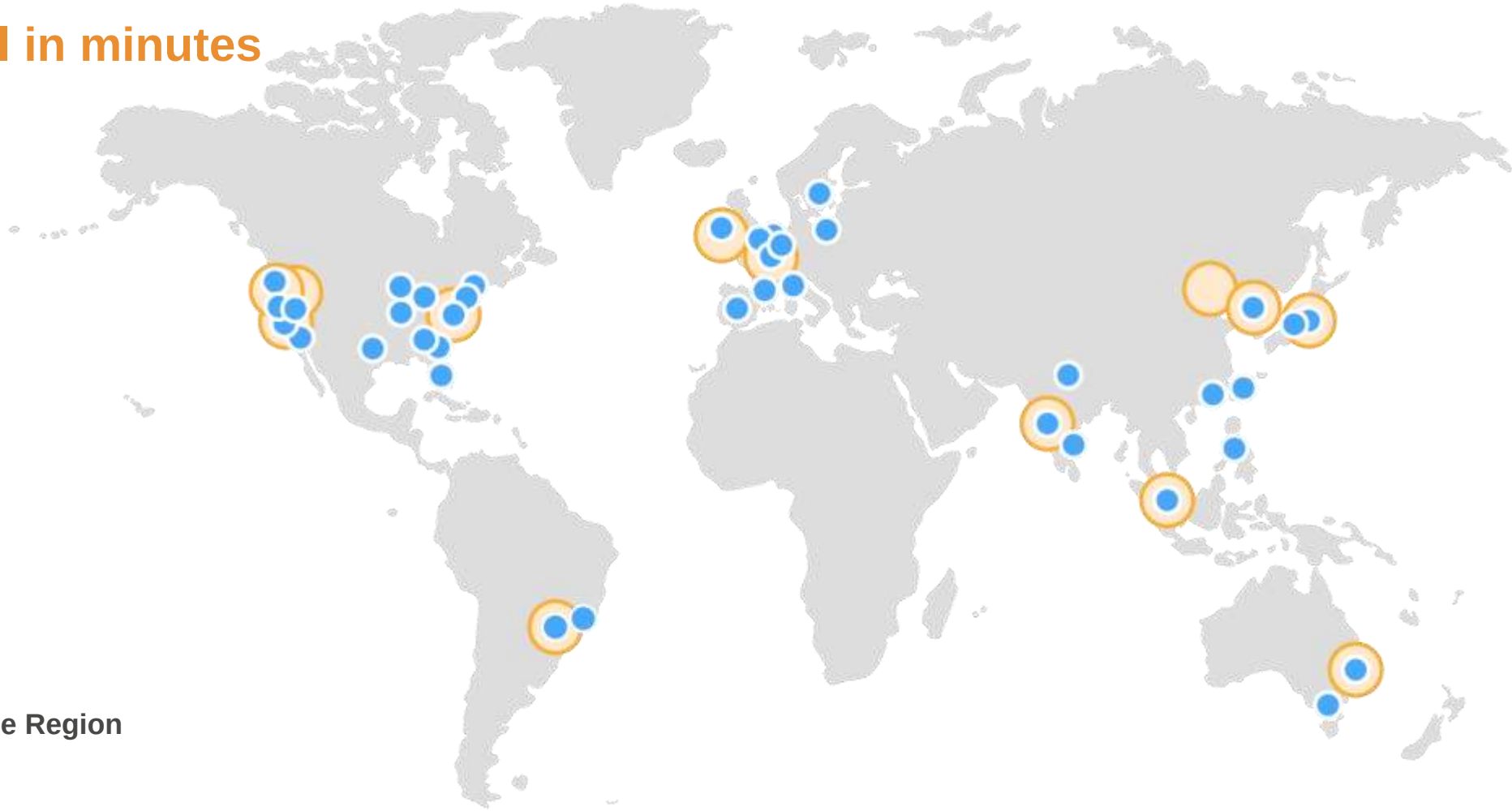
Speed to Market | Resource Optimization | Operational Efficiency

Increase Agility through Experimentation

- Reduce the time to get resources available (just minutes).
- Lower the cost and time to experiment and develop.
- Increase agility for your organization.

Speed to Market | Resource Optimization | Operational Efficiency

Go global in minutes

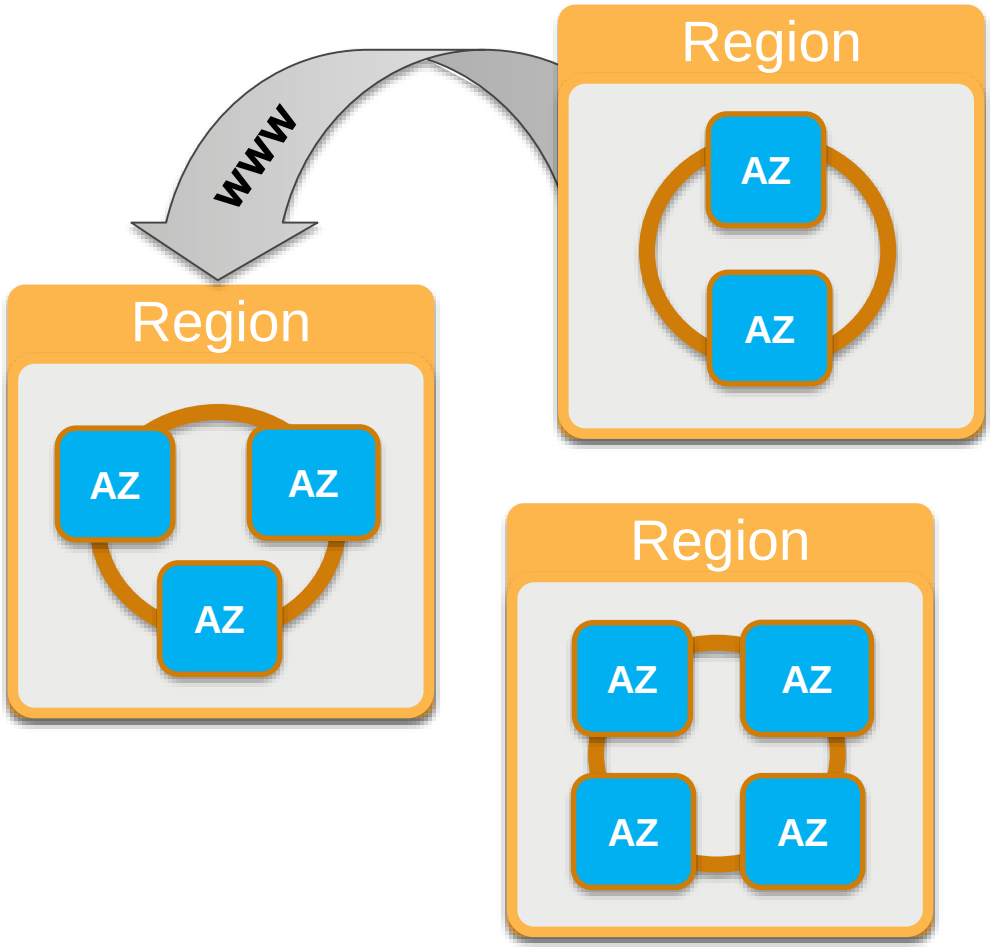


Speed to Market | Resource Optimization | Operational Efficiency

Regions

- Choose which region:
  - ✓ Optimize latency
  - ✓ Minimize costs
  - ✓ Regulatory requirements
  - ✓ Available features

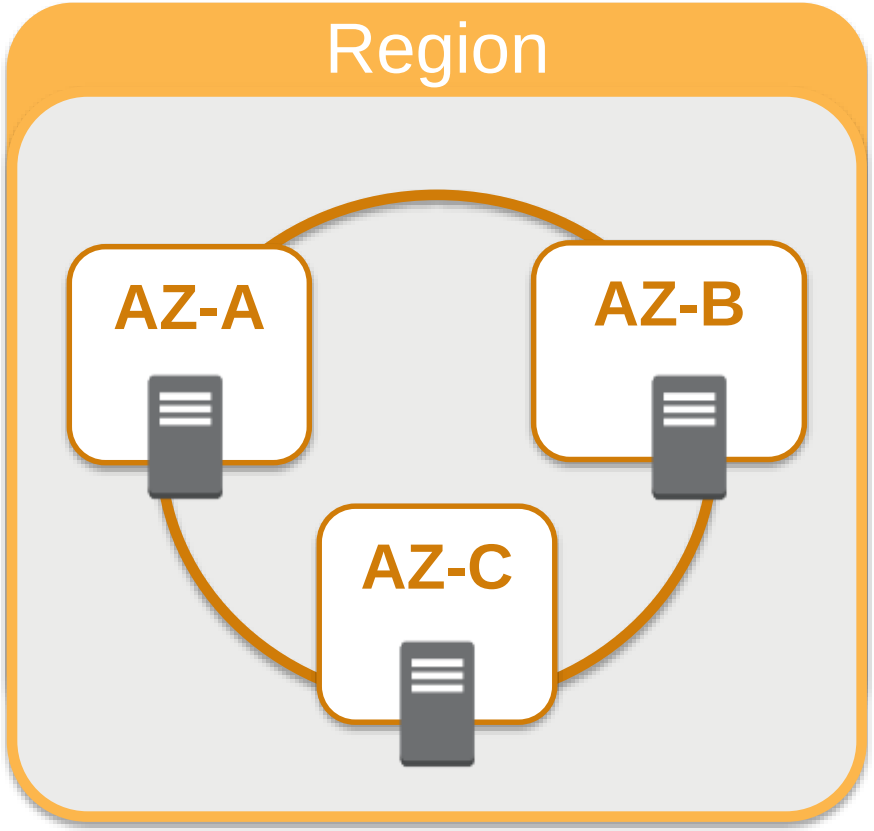
- Traffic transfers over the Internet
  - (!) Encrypt your data



Speed to Market | Resource Optimization | Operational Efficiency

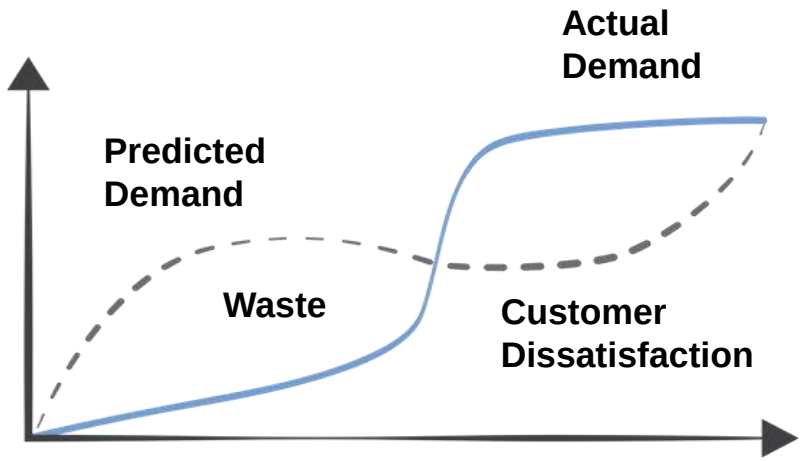
Availability Zones

- Associated with datacenters within each Region
- Isolated from other Availability Zones
- Connected by a low-latency link

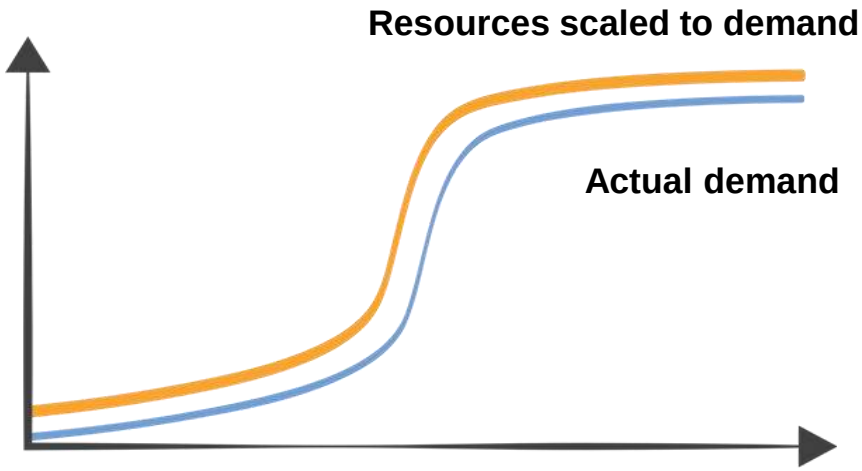


Speed to Market | Resource Optimization | Operational Efficiency

Stop Guessing Capacity



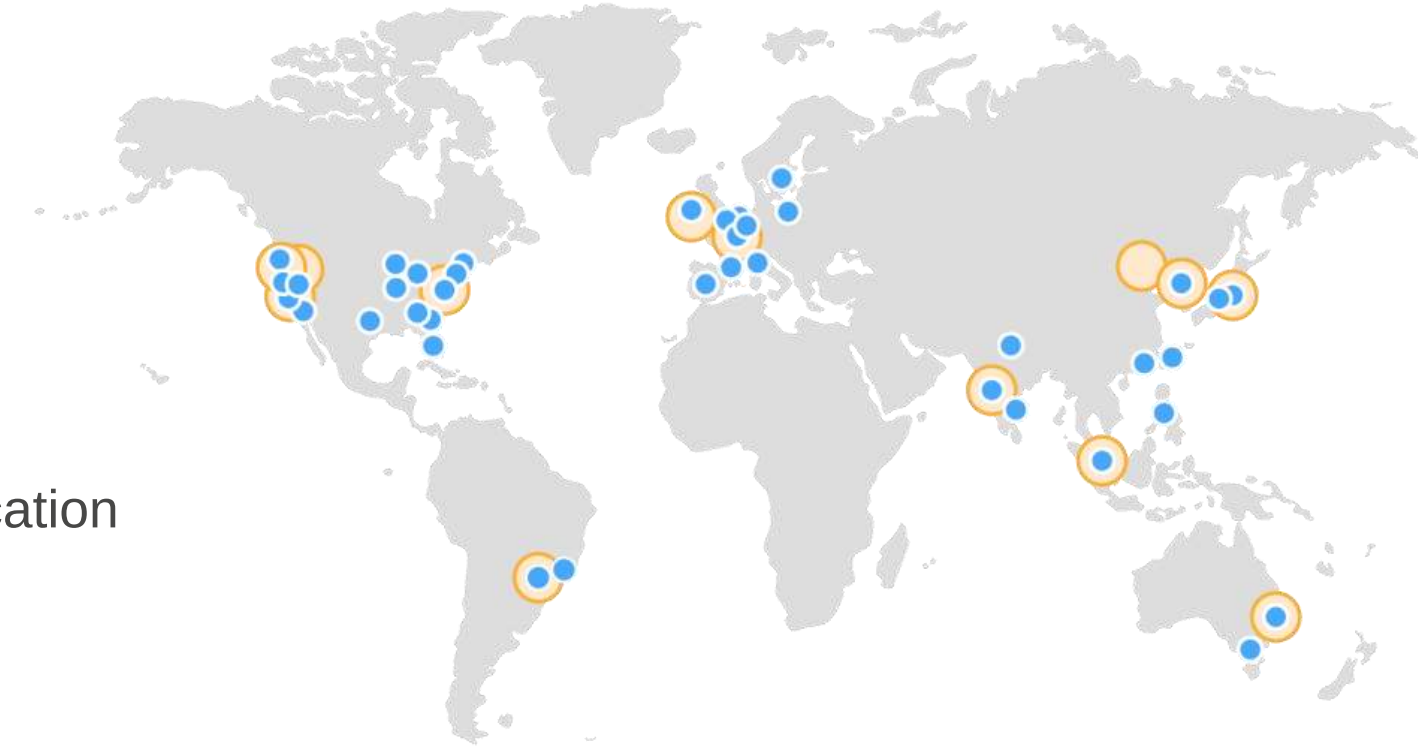
Rigid On-Premises Resources



Elastic Cloud-Based Resources

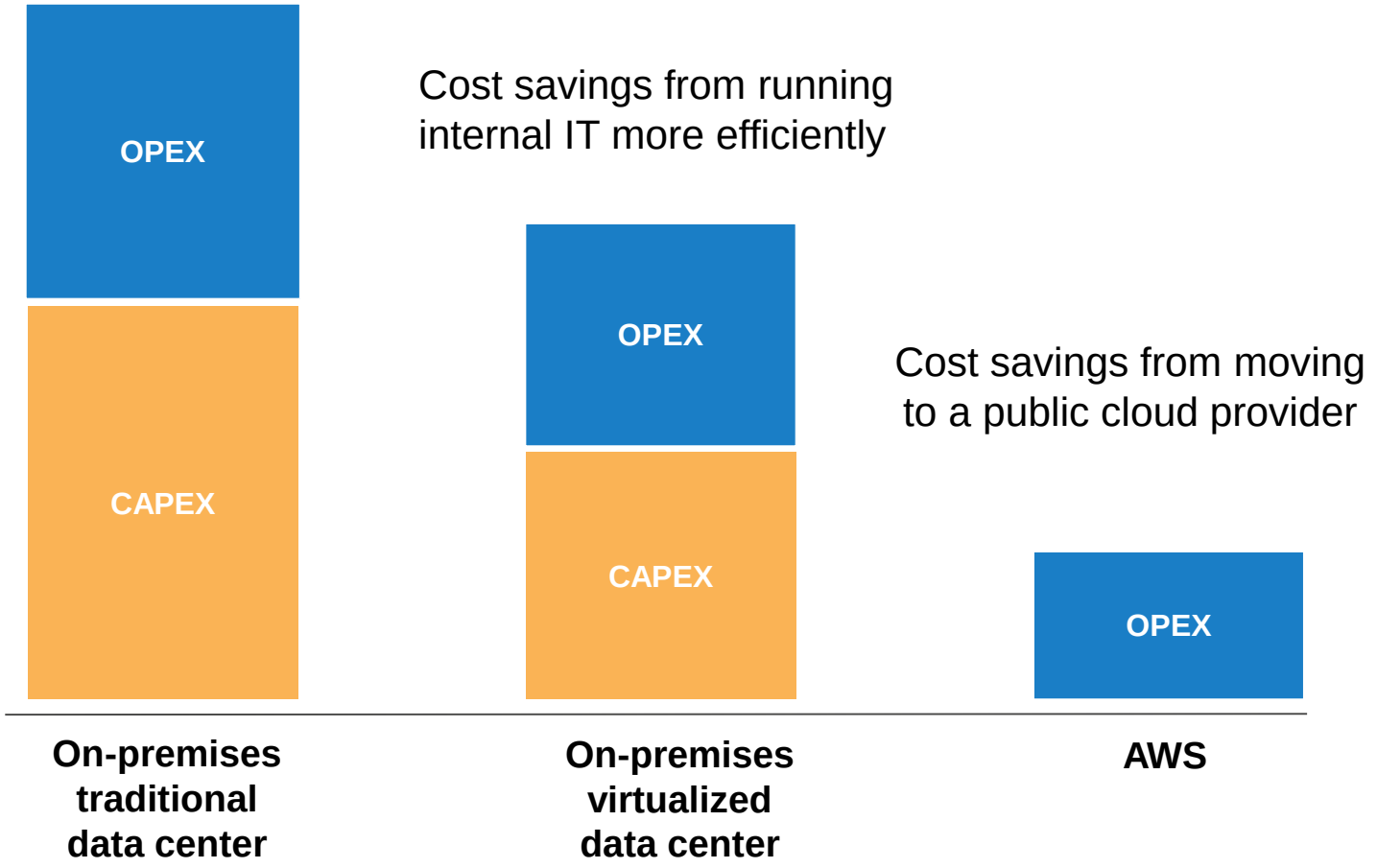
Speed to Market | **Resource Optimization** | Operational Efficiency

- Edge locations host a CDN
  - Web sites
  - Dynamic/static
  - Streaming
- Requests routed to the nearest edge location
- Faster content delivery



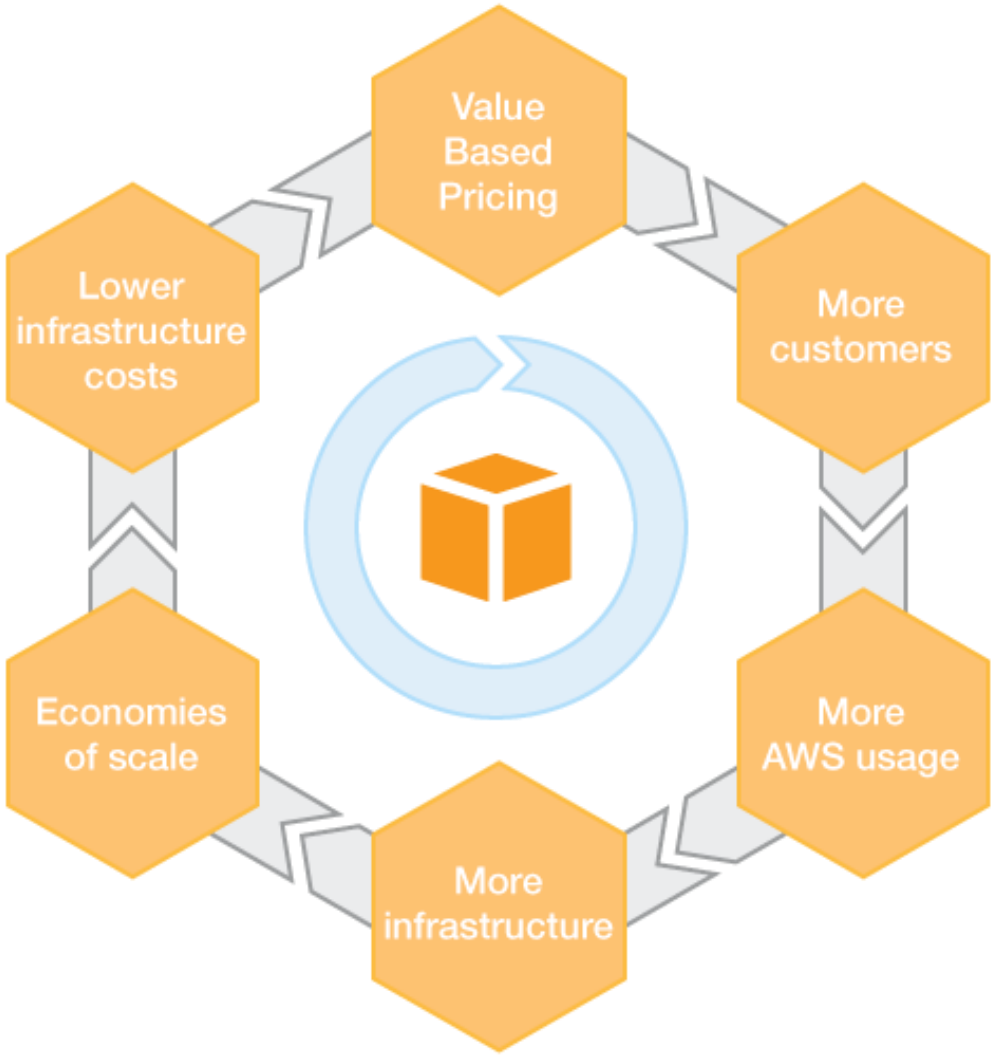
Speed to Market | Resource Optimization | Operational Efficiency

Trading CAPEX for OPEX



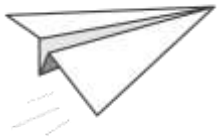
Speed to Market | Resource Optimization | Operational Efficiency

Benefit from Massive Economies of Scale



A Quick Review

- ✓ Increase agility through experimentation
- ✓ Stop guessing capacity
- ✓ Trade CAPEX for OPEX
- ✓ Go global in minutes
- ✓ Benefit from massive economies of scale



Speed to Market

Resource Optimization

Operational Efficiency

What's in Module 1

- What is cloud computing?
- Why do organizations leverage cloud computing services?
- Who is using cloud computing services?

AWS Customers

Over 1 million **Active** customers in 190 countries

Enterprises

Startups

Public Sectors

Key Takeaways

- What is cloud computing?
  - The on-demand delivery of IT resources and applications via the Internet, with pay-as-you-go pricing.

- What are the three key advantages of the cloud?
  - Faster speed to market.
  - Optimization of resources.
  - Increased operational efficiency.

AWS Business Essentials

Module 1: Getting Started with the Cloud

Module 2: Leveraging AWS for Competitive Advantages

Module 3: Cloud Economics

Module 4: Security and Compliance

Module 5: Migrating to the Cloud

What's in Module 2

- Cloud computing framework
- Big data
- Mobile
- Disaster recovery

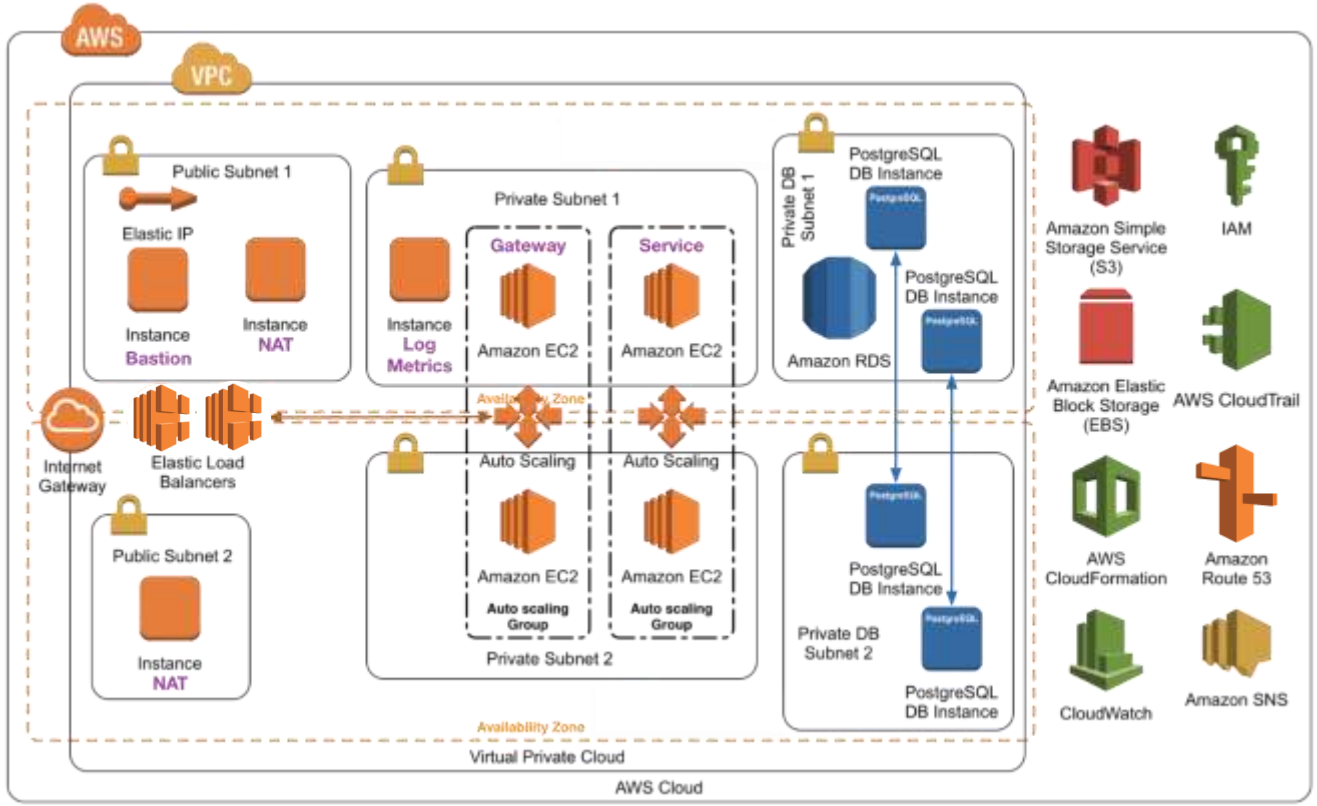
Part 1 Cloud Computing Framework

- ✓Business challenges
- ✓Cloud computing infrastructure
- ✓The AWS core services

Business Challenges

- Budget constraints
- Complex infrastructure management and deployment
- Slower scalability
- Low speed to market
- Security concerns and compliance requirement

Cloud Computing Infrastructure



Speed to Market

Resource Optimization

Operational Efficiency

Elasticity

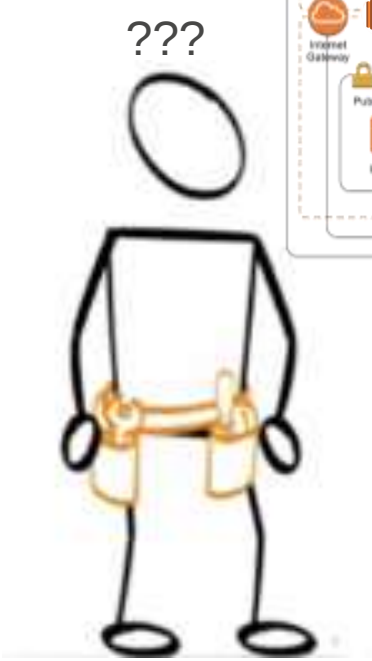
High Availability

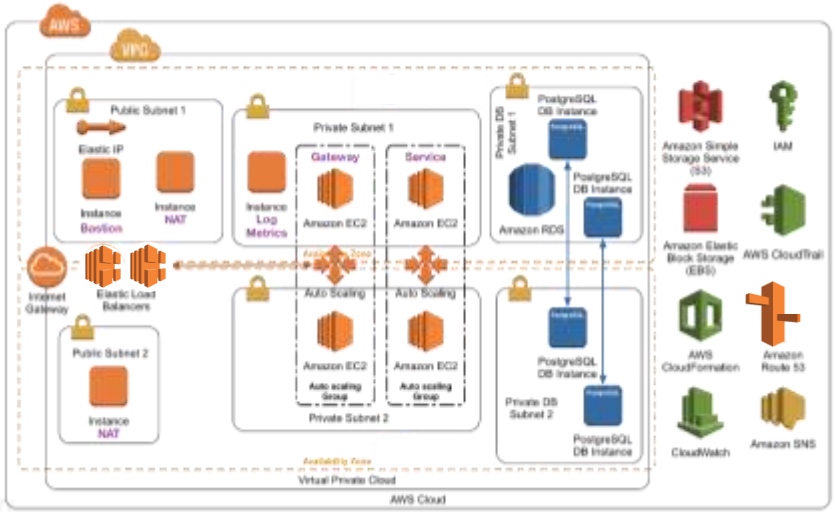
Security

Complicated?

Let’s start from

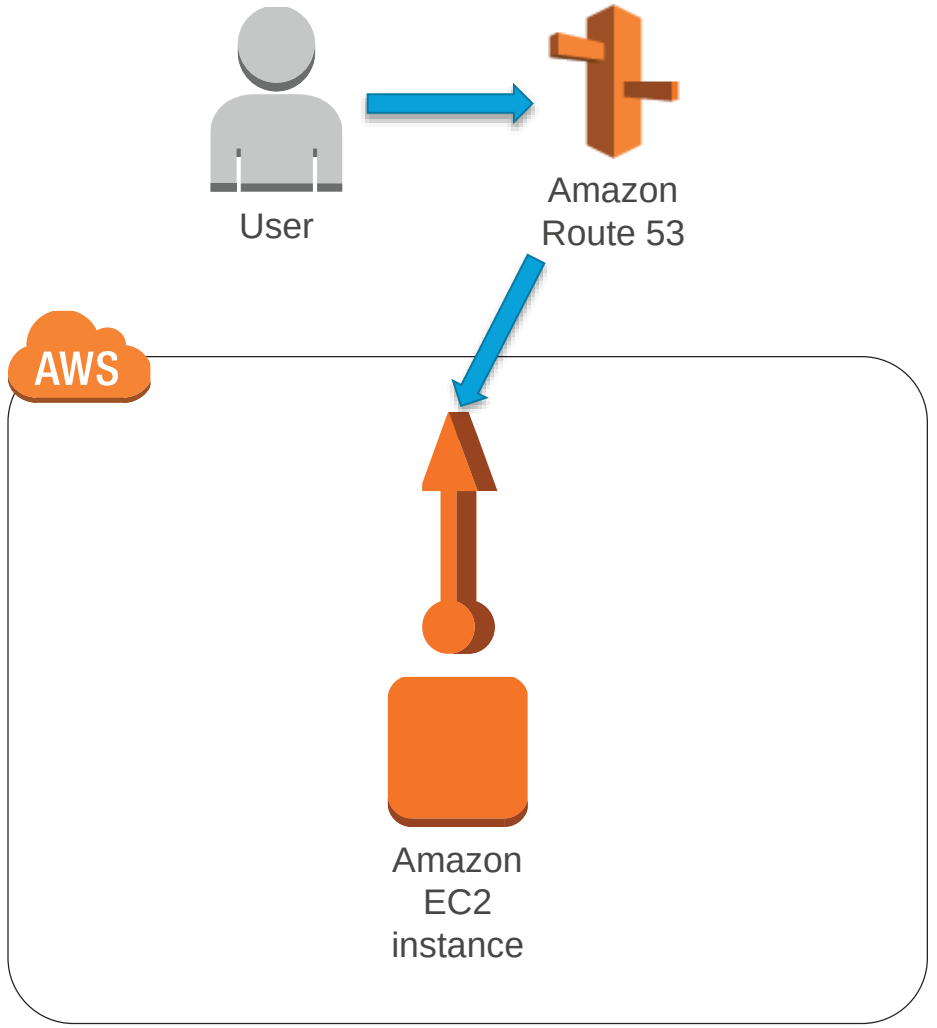
1 User……





Cloud Computing Infrastructure: 1 User

- Amazon Route 53 for DNS
- A single Amazon EC2 instance
  - With full stack on this host
    - Web app
    - Database
    - Management
    - ……

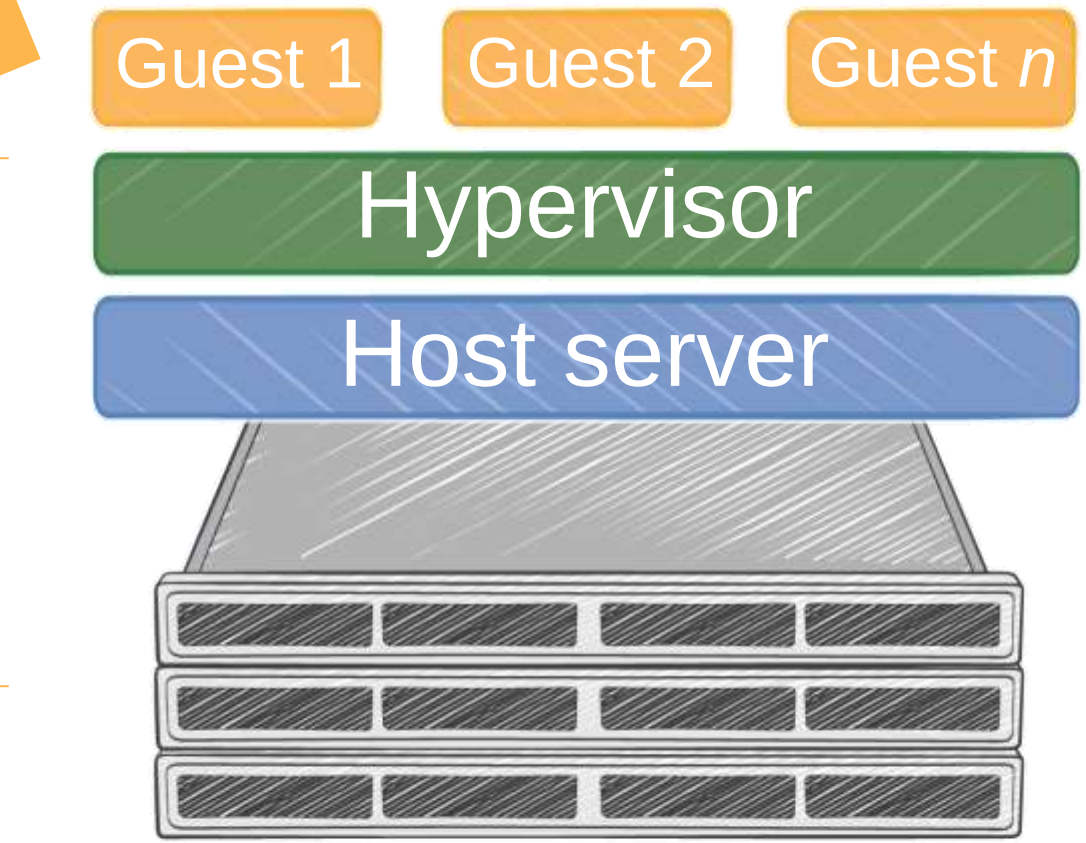


AWS Compute Services

Amazon EC2

Elastic virtual servers in the cloud

Server rack



AWS Compute Services

Amazon EC2

- General purpose
- Compute-optimized
- Memory-optimized
- Storage-optimized
- GPU

Instances

Types

Sizes

- From Nano to 8xlarge
- Easily resize an instance

Amazon Machine Image (AMI)

- Choose an operating system type and version
- Create and customize your own AMIs

AWS Core Services Summary

Compute

Amazon EC2

Networking

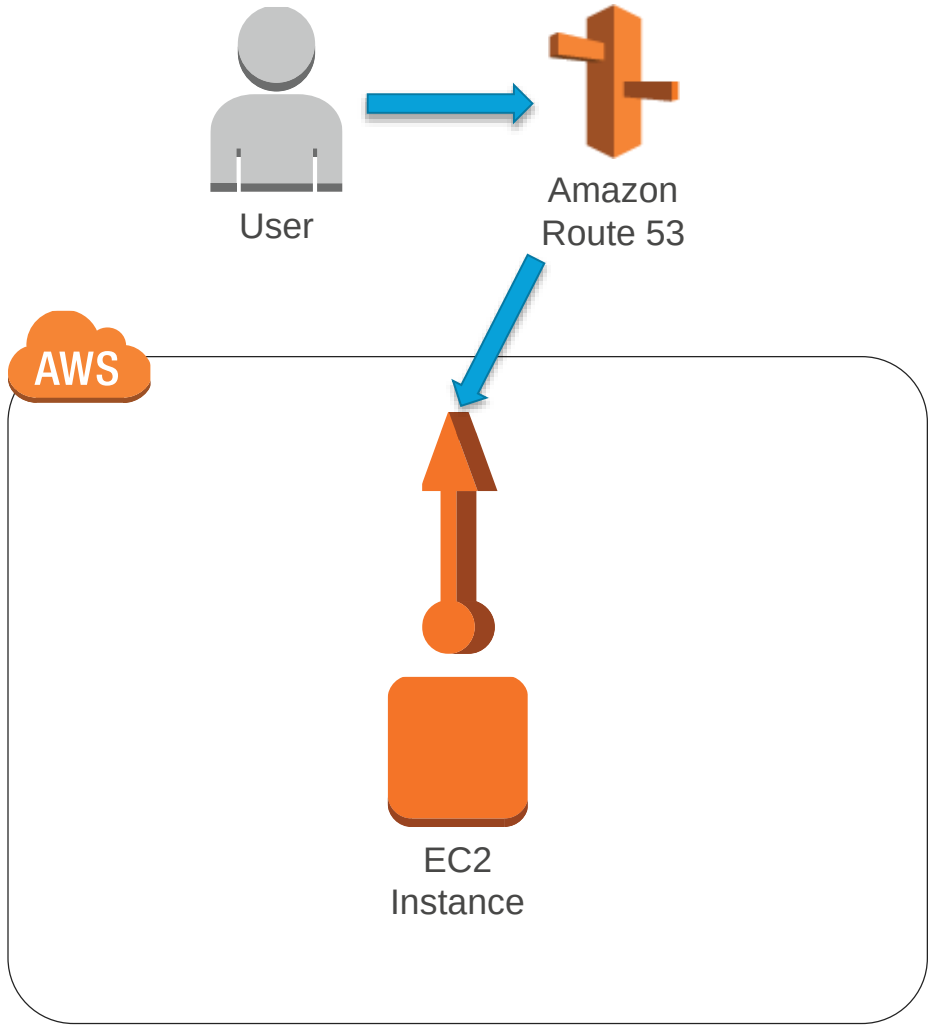
Amazon Route 53

Storage

Database

Cloud Computing Infrastructure: 1 User

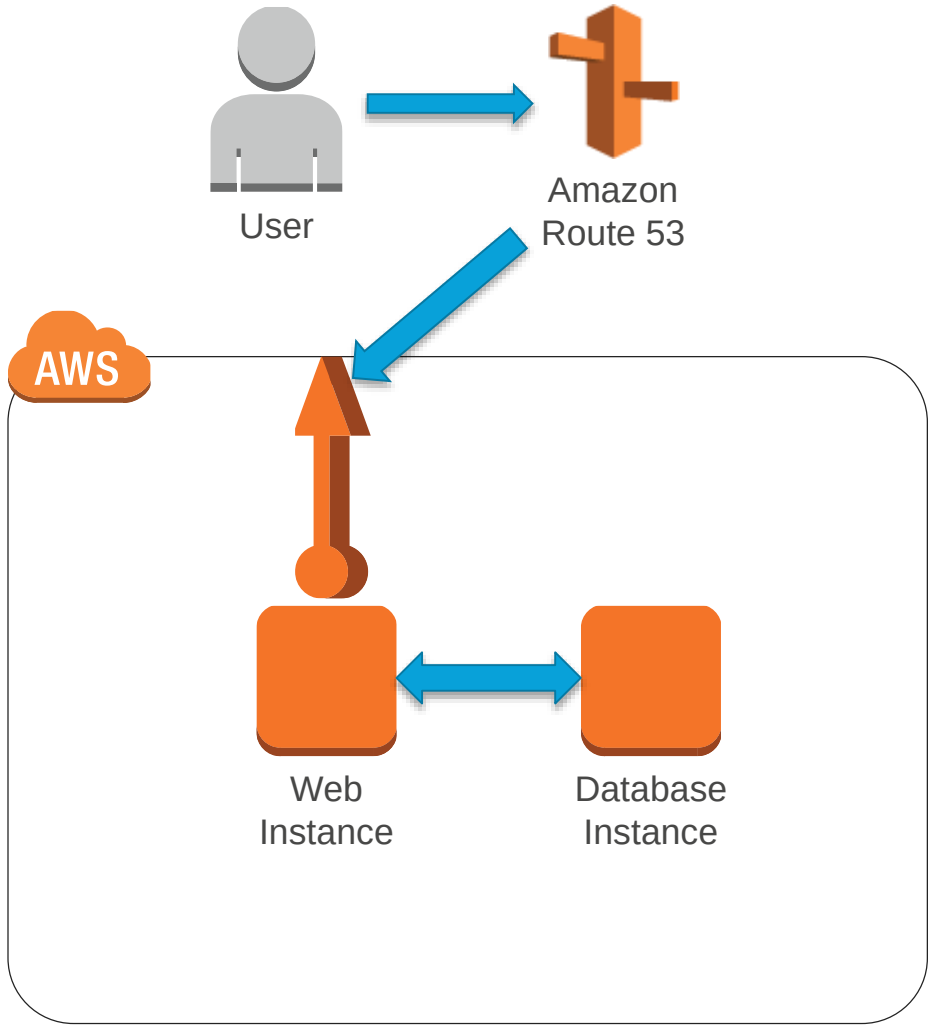
Challenges: Single Point of Failure



Cloud Computing Infrastructure: Users > 1

Separate out the single host into:

- Web host
- Database host
  - Make use of a database service?



AWS Database Services: Database Options

Self-managed

Database server on Amazon EC2

- Bring Your Own License (BYOL)

Fully managed

Amazon RDS

- BYOL or
- License included

Amazon DynamoDB

- Seamless scalability
- Zero administration

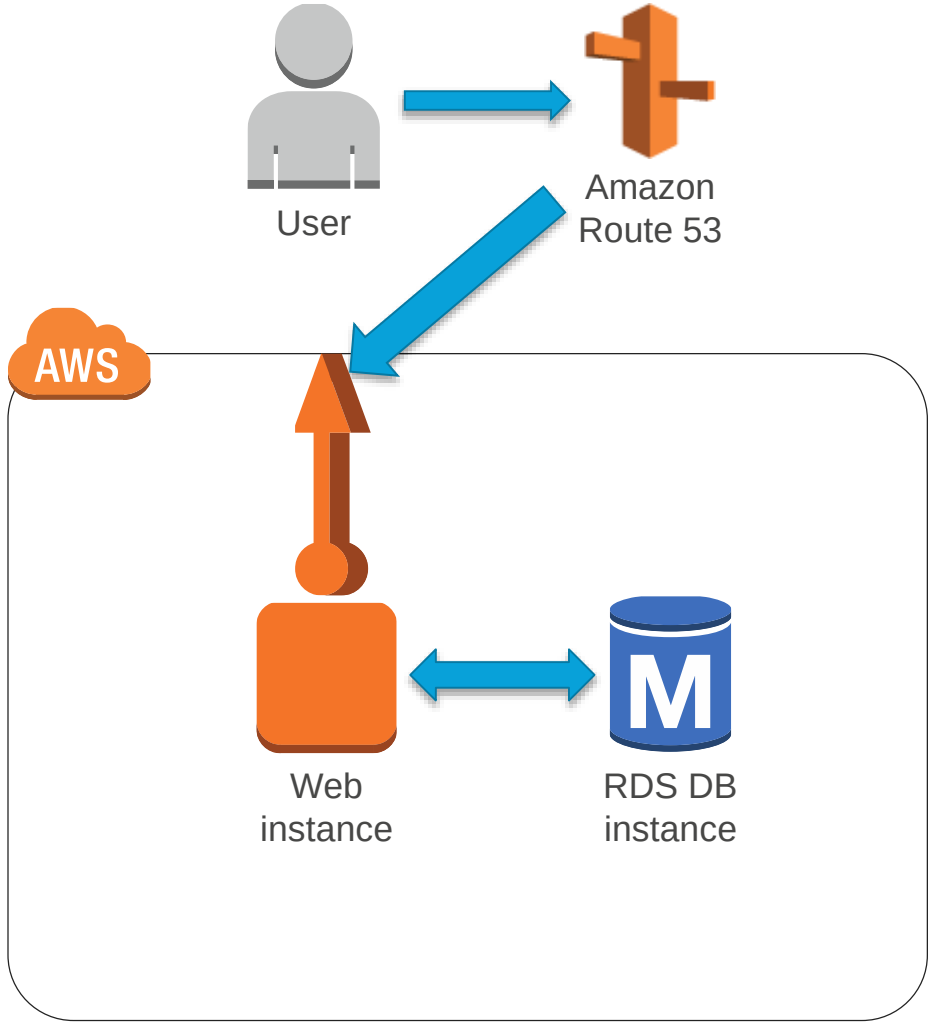
Amazon Redshift

- Petabyte-scale data
- Easy to scale, fast

Cloud Computing Infrastructure: Users > 100

Separate out the single host into:

- Web host
- Database host
  - Amazon RDS: make your life easier



AWS Core Services Summary

Compute

Amazon
EC2

Networking

Amazon
Route 53

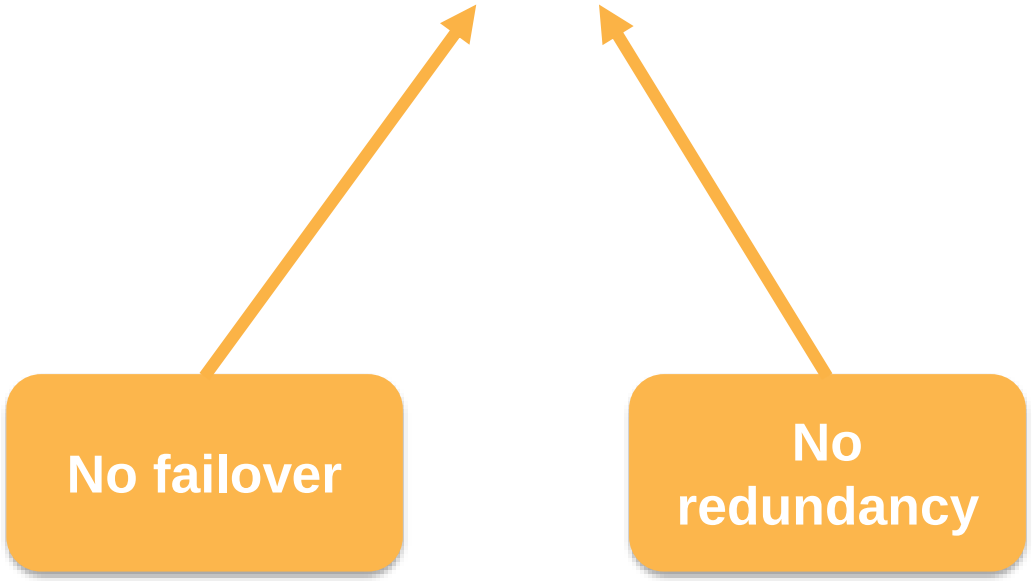
Storage

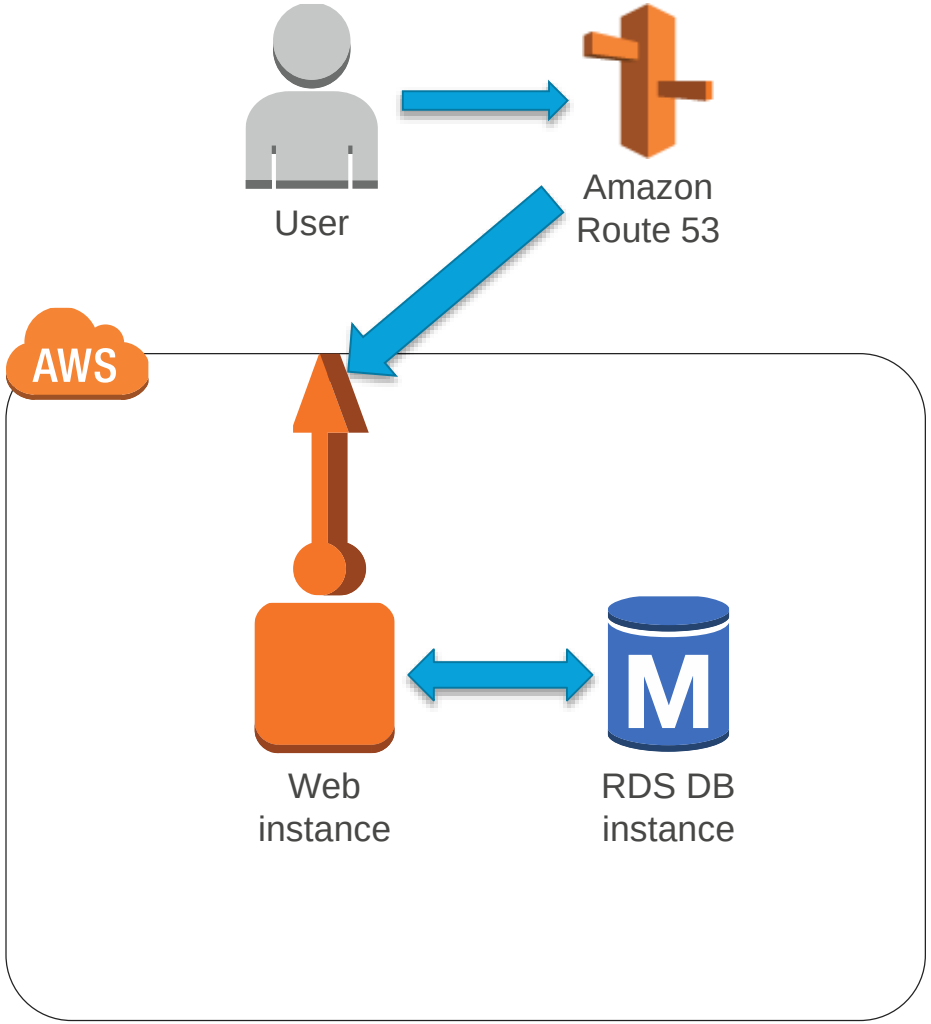
Database

Amazon
RDS
Amazon Aurora

Cloud Computing Infrastructure: Users > 1000

Challenge: Too many eggs in one basket

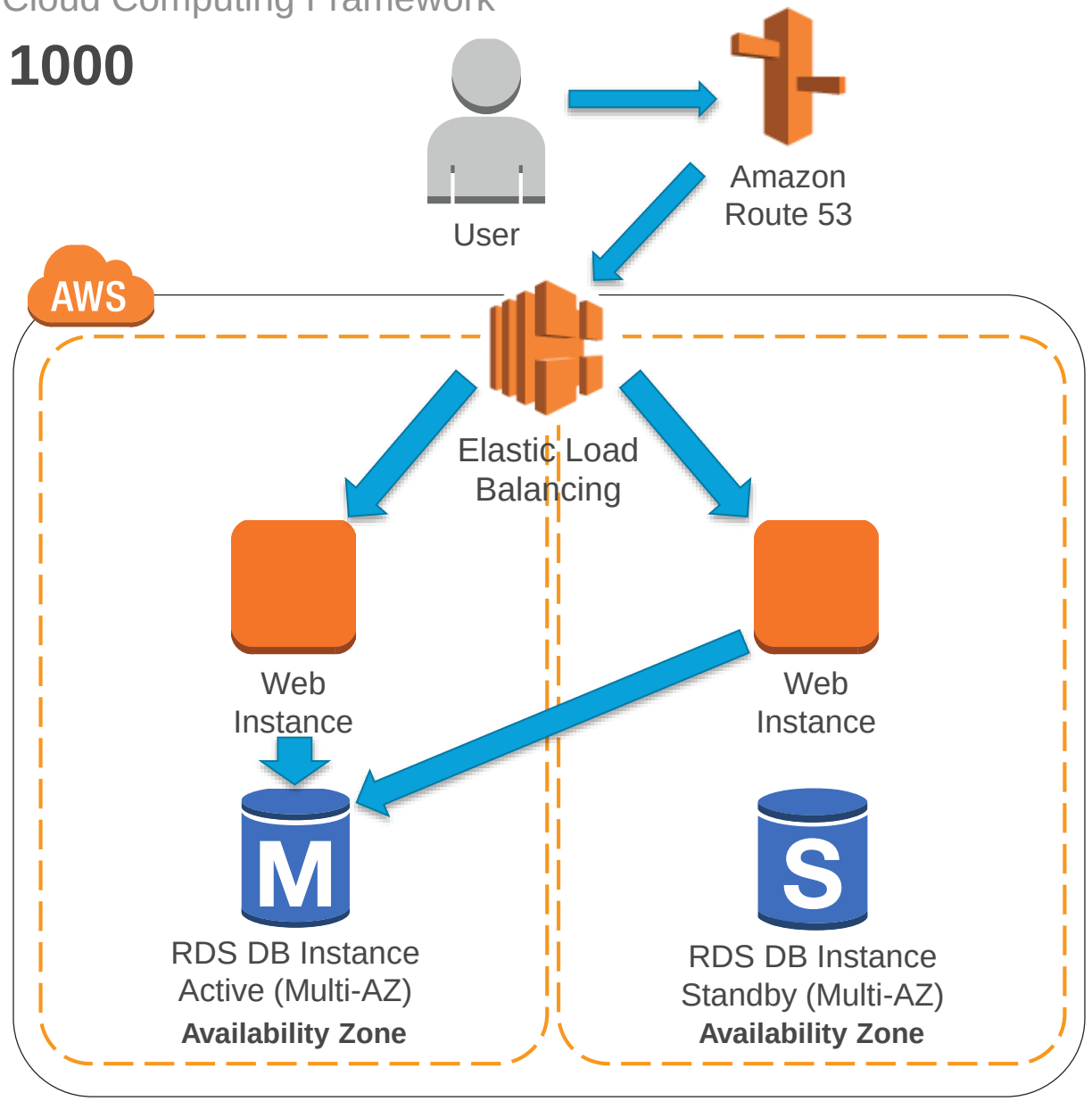




Cloud Computing Infrastructure: Users > 1000

Solution: High Availability

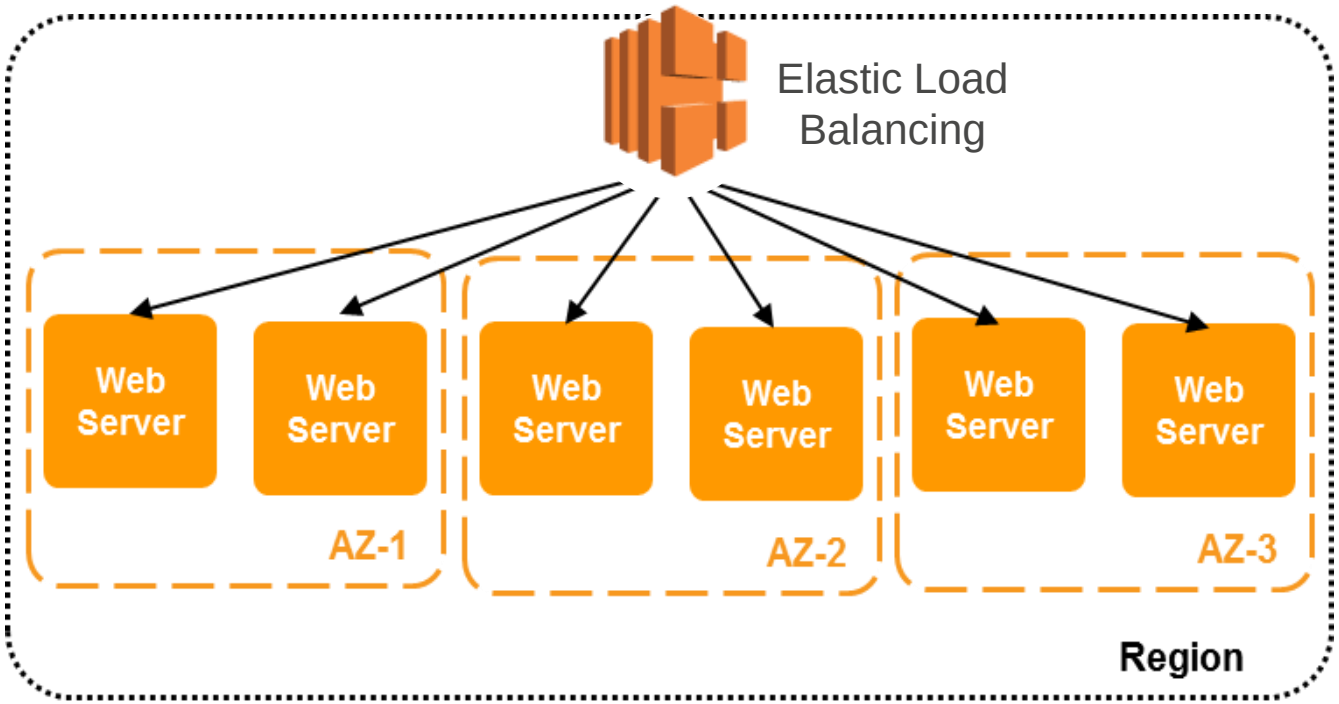
- Another web instance
  - In another Availability Zone
- RDS Multi-AZ
- Elastic Load Balancing (ELB)



AWS Compute Services

Elastic Load Balancing

- Health checks on hosts
- Distribution of traffic
- Dynamic addition and removal of EC2 hosts



Two Types
- **Classic Load Balancer**: balance traffic on network layer (HTTP(S), TCP/SSL)
- **Application Load Balancer**: balance traffic on application level

AWS Core Services Summary

Compute

Amazon EC2

Elastic Load Balancing

Networking

Amazon Route 53

Storage

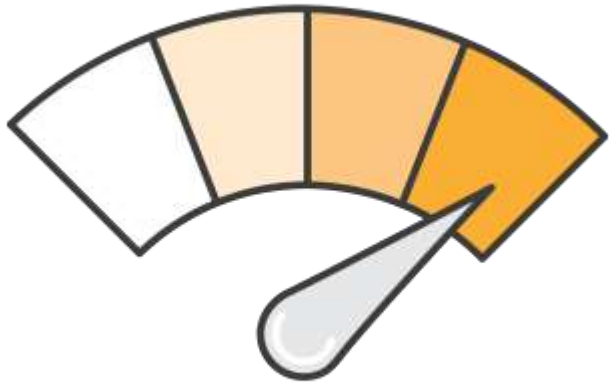
Database

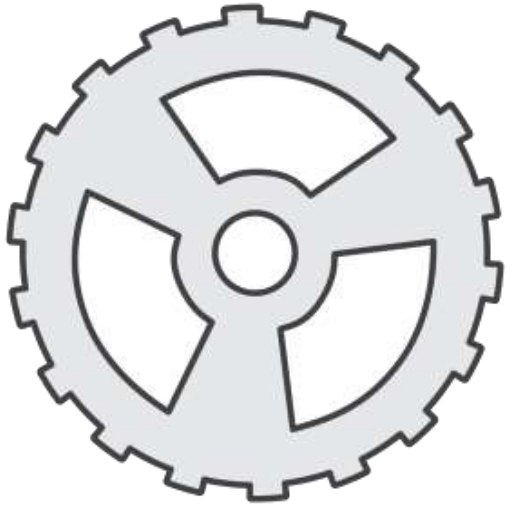
Amazon RDS

Amazon Aurora

Cloud Computing Infrastructure: Users > 10,000s–100,000s

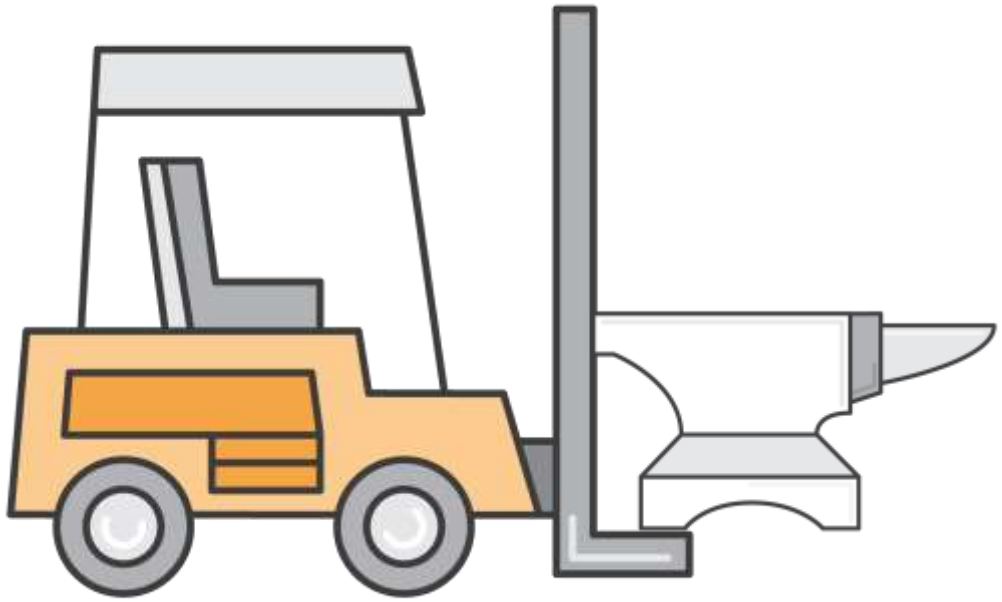
What about *performance* and *efficiency*?





Cloud Computing Infrastructure: Users > 10,000s–100,000s

Lighten the Load

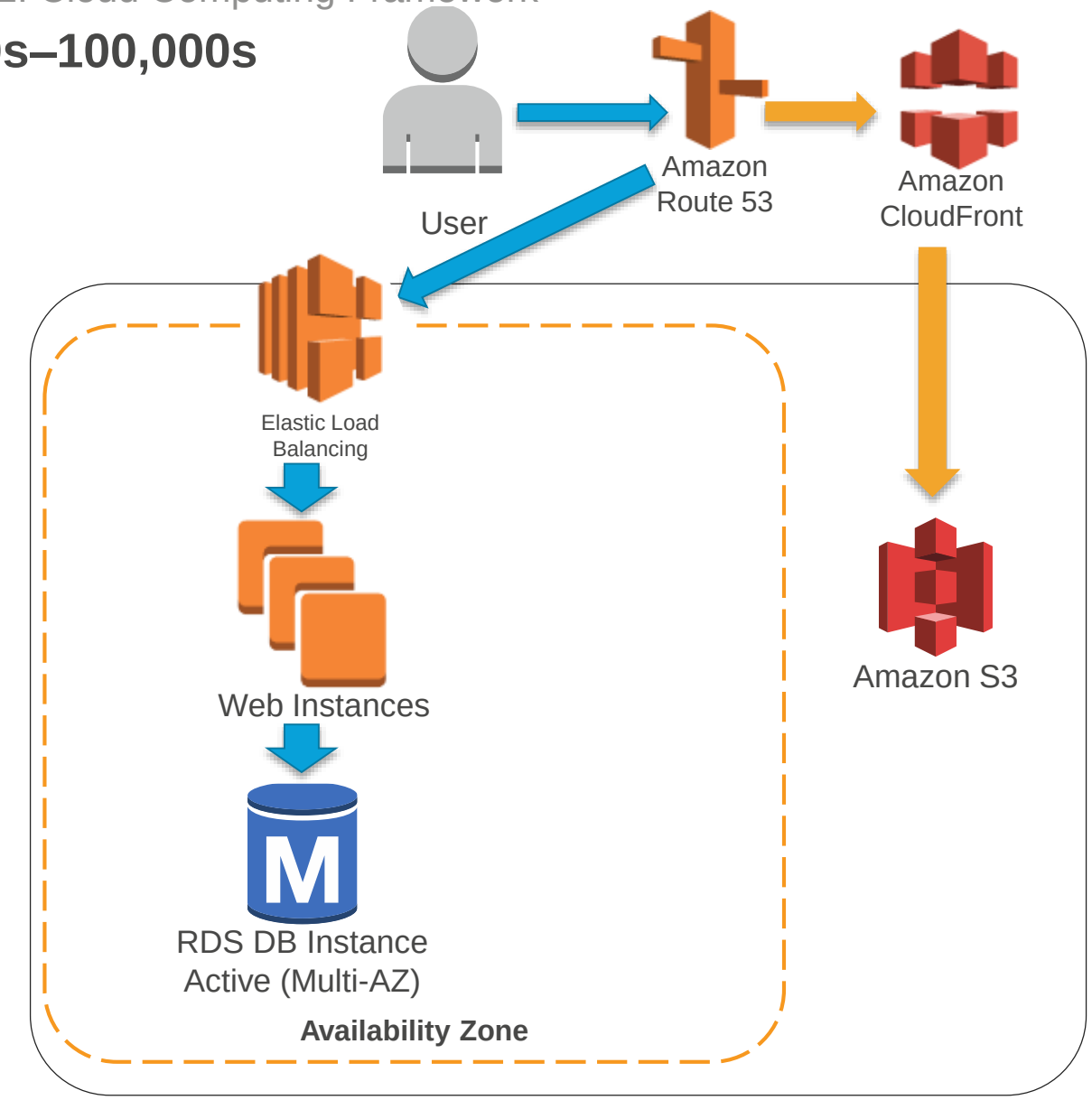


Cloud Computing Infrastructure: Users > 10,000s–100,000s

Shift some load around

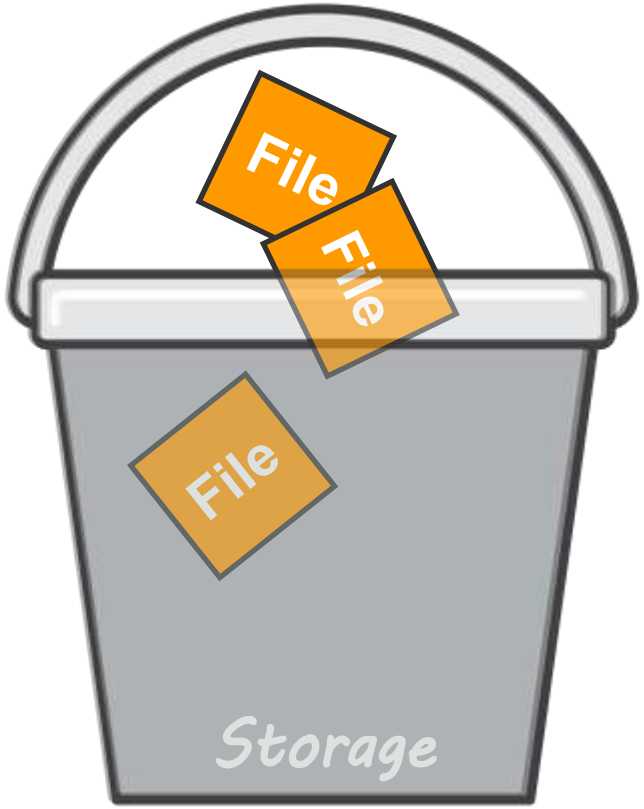
Static content to:

- Amazon S3
- Amazon CloudFront



AWS Storage Services

Amazon S3



Delete

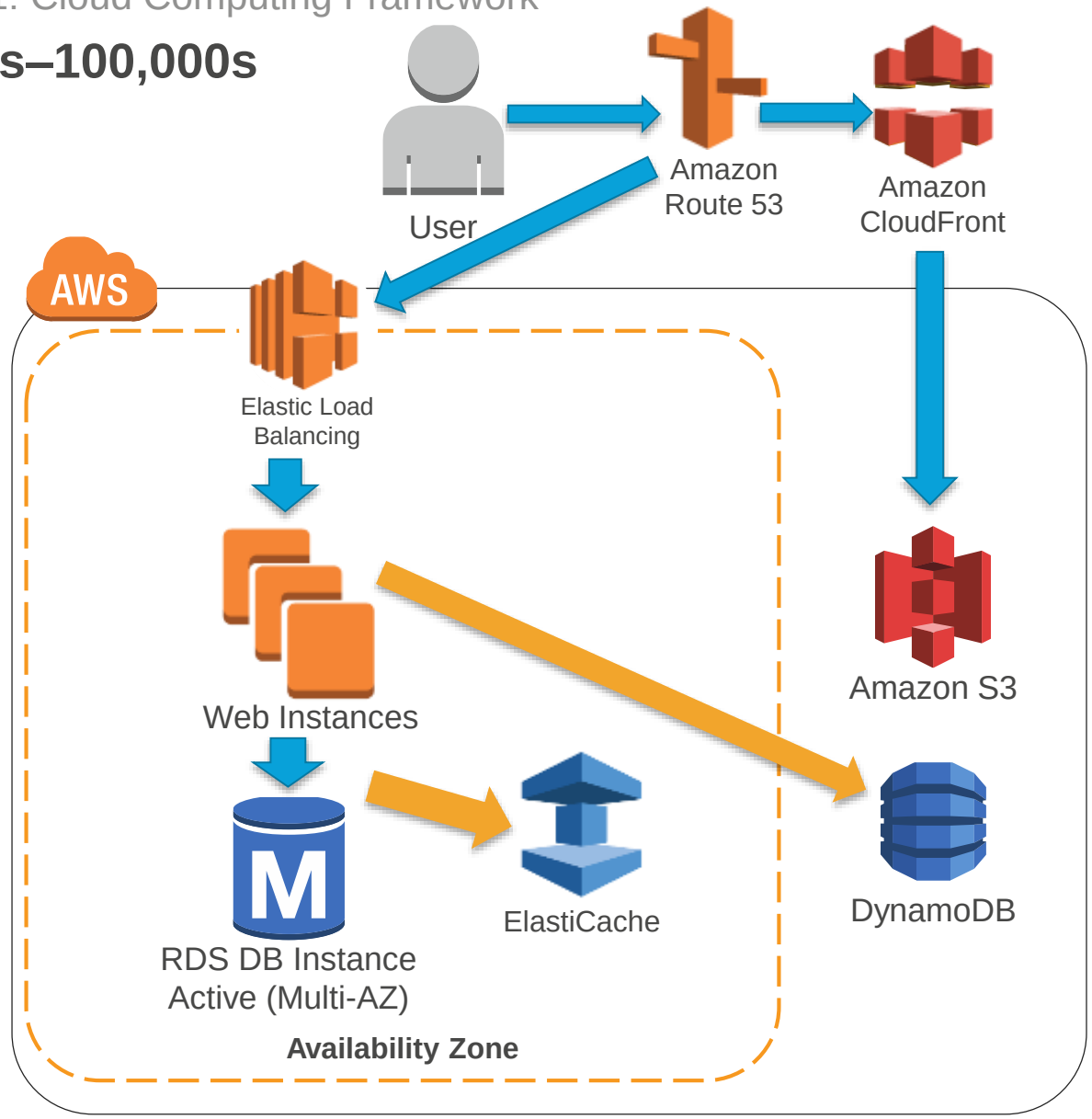
Upload

- Object storage and distribution for the internet
- 99.999999999% durability
- Storage classes
  - ✓ Standard
  - ✓ Standard – Infrequent Access
  - ✓ Glacier

Cloud Computing Infrastructure: Users > 10,000s–100,000s

Shift some load around

- Static content to Amazon S3 and Amazon CloudFront
- Session/state to Amazon DynamoDB
- DB caching to Amazon ElastiCache



AWS Core Services Summary

Compute

Amazon EC2

Elastic Load Balancing

Networking

Amazon Route 53

Storage

Amazon S3

CloudFront

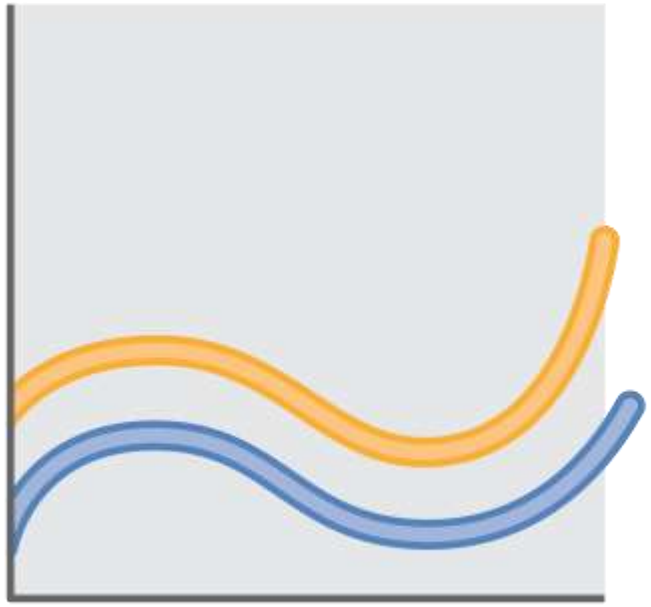
Database

Amazon RDS

Amazon Aurora

DynamoDB

Auto Scaling!



AWS Compute and Management Services

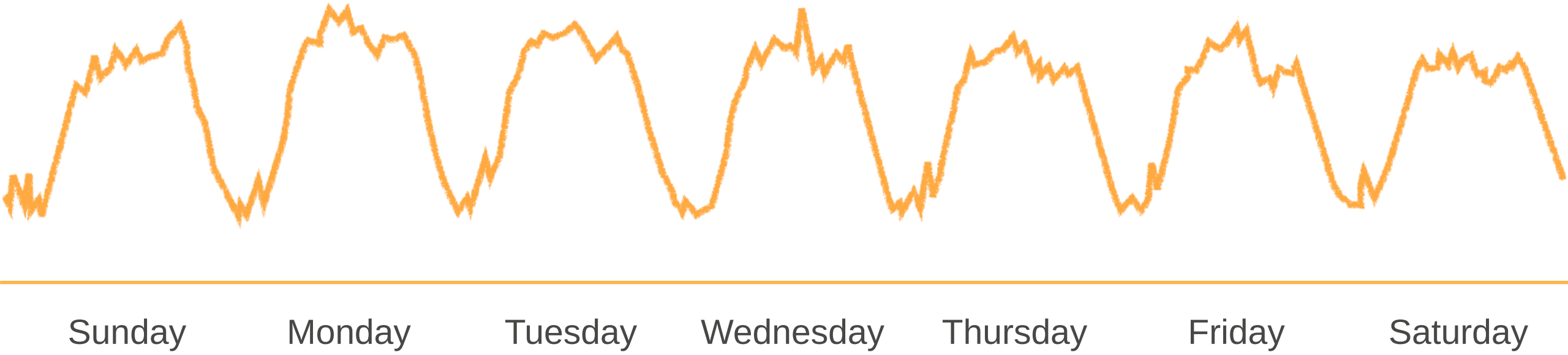
Auto Scaling

- Automatic resizing of compute clusters
- Define min/max pool sizes
- Amazon CloudWatch metrics drive scaling

Amazon CloudWatch

- Monitor resources and application automatically

Typical Weekly Traffic to Amazon.com



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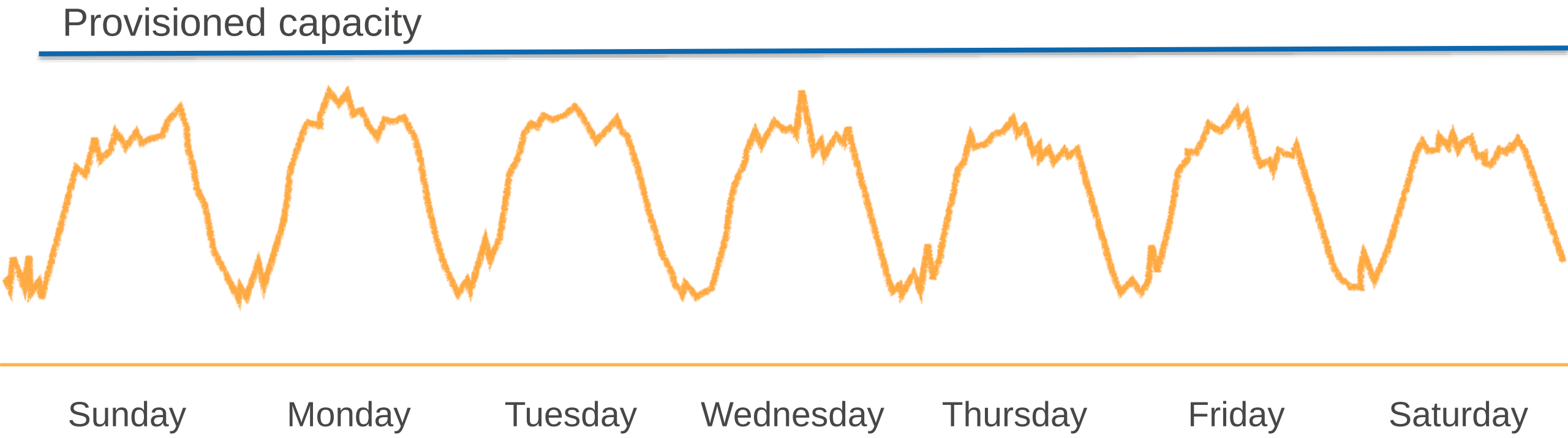
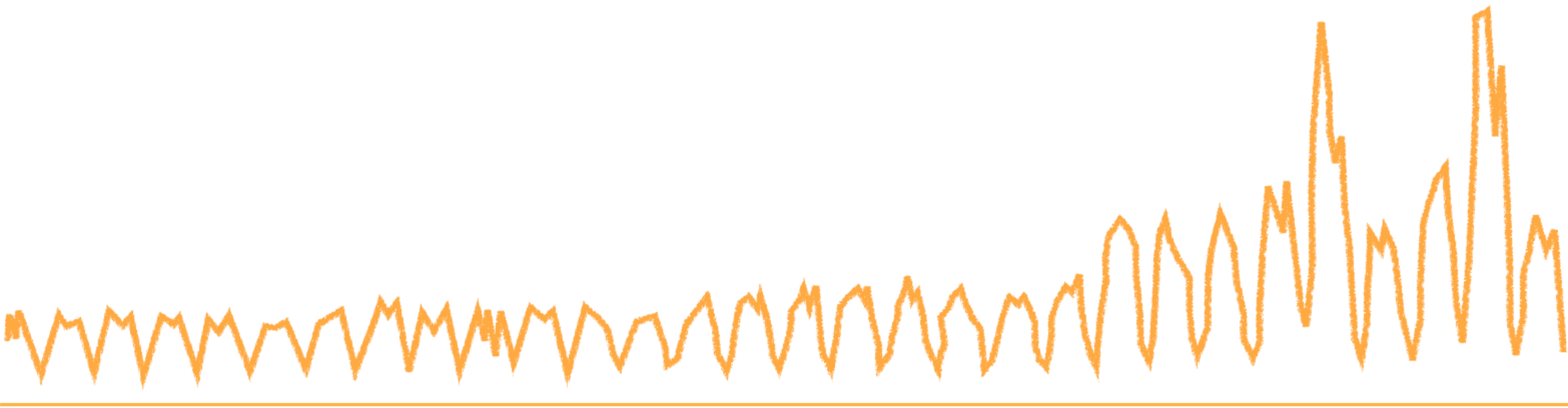
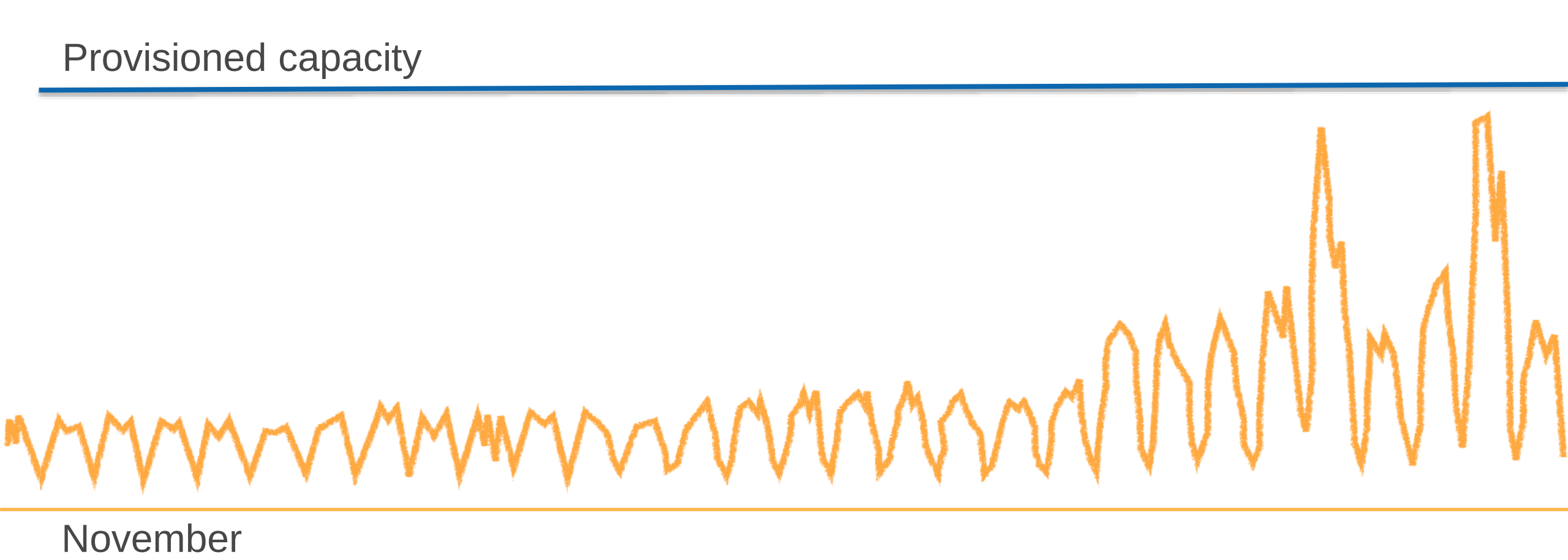


November Traffic to Amazon.com



November

November Traffic to Amazon.com



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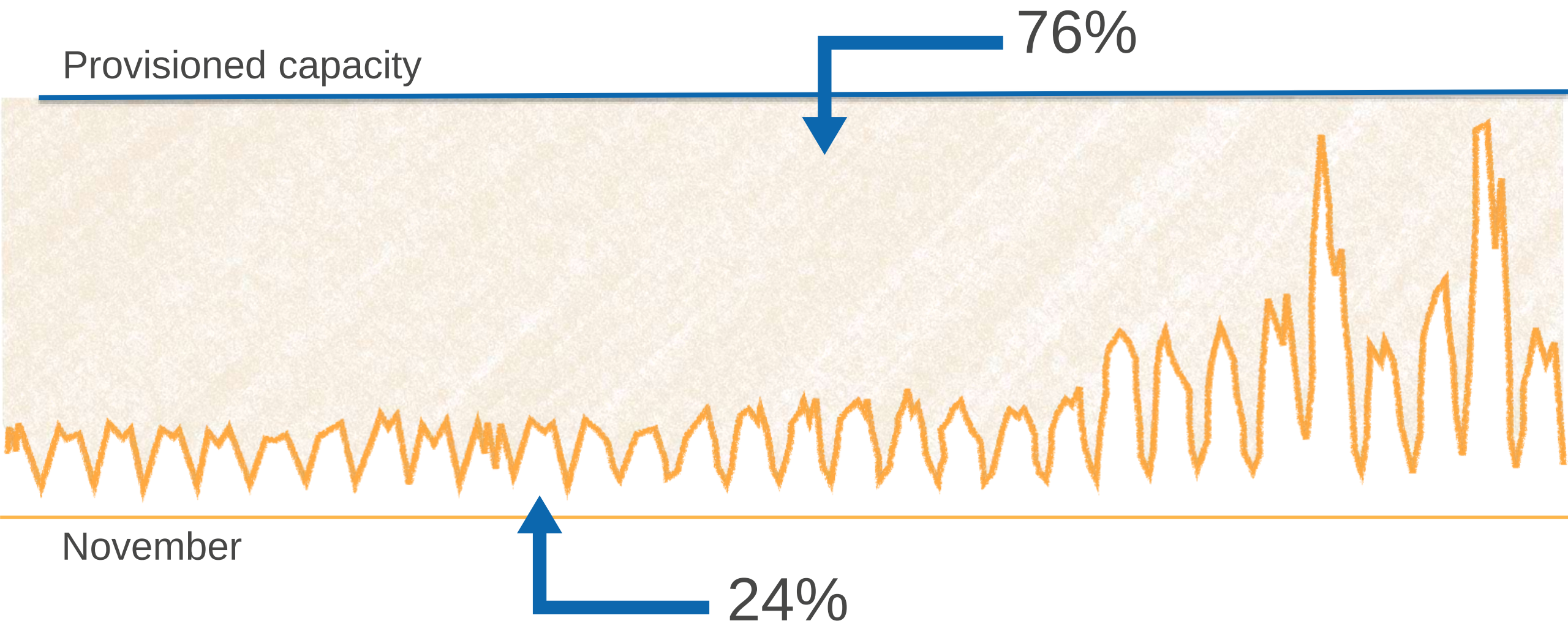

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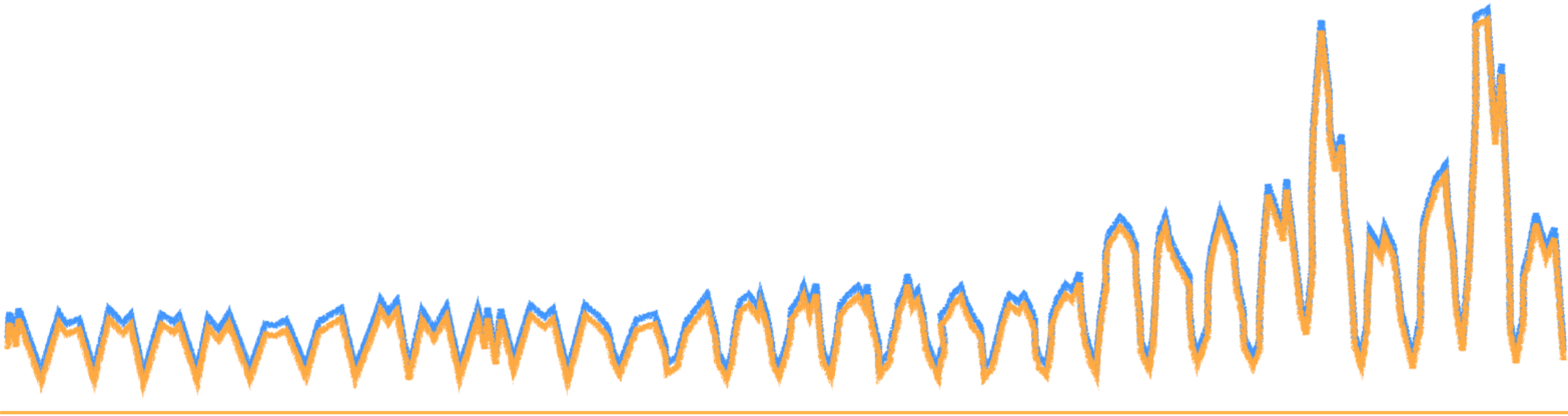
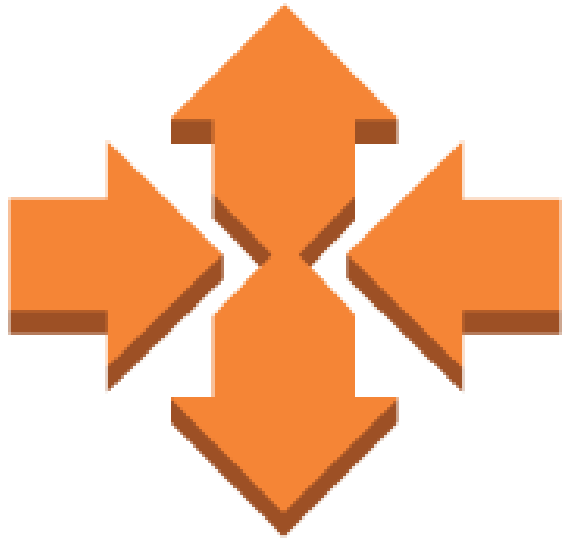


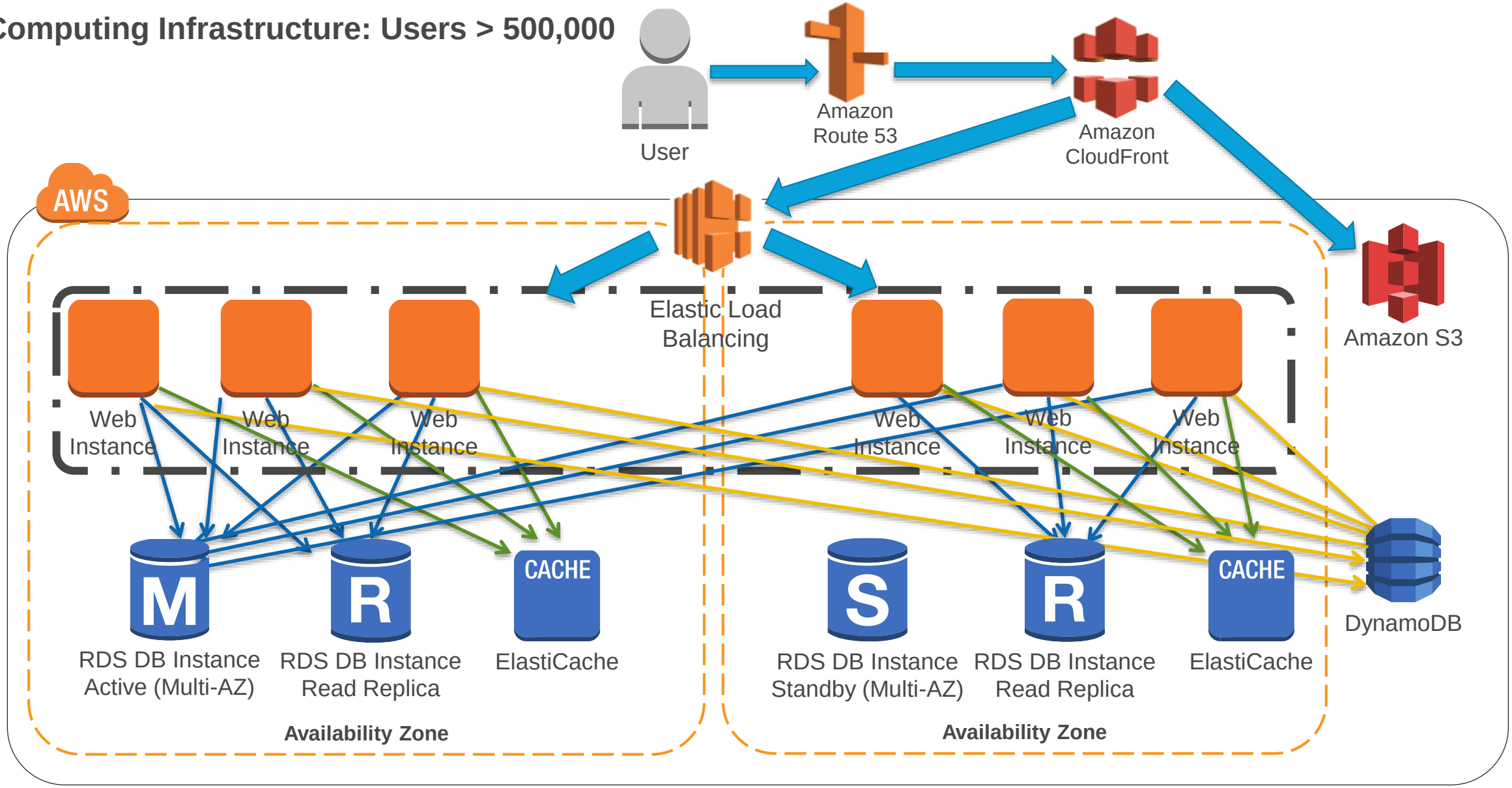
November

Auto Scaling lets you do this!



Use it from the very beginning!

Cloud Computing Infrastructure: Users > 500,000



AWS Core Services Summary

Compute


Amazon EC2


Elastic Load Balancing


Auto Scaling

Networking


Amazon Route 53

Storage


Amazon S3

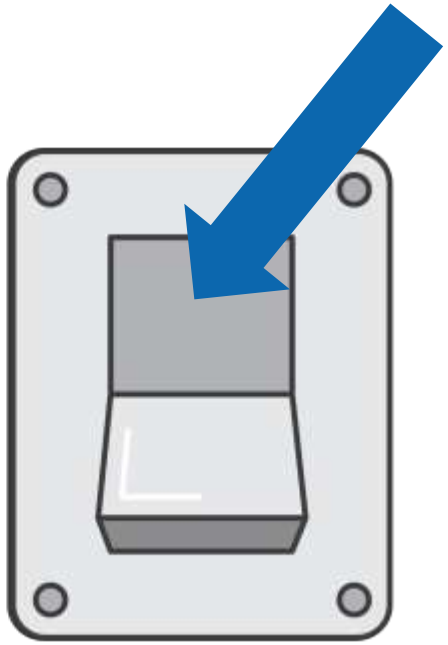

CloudFront

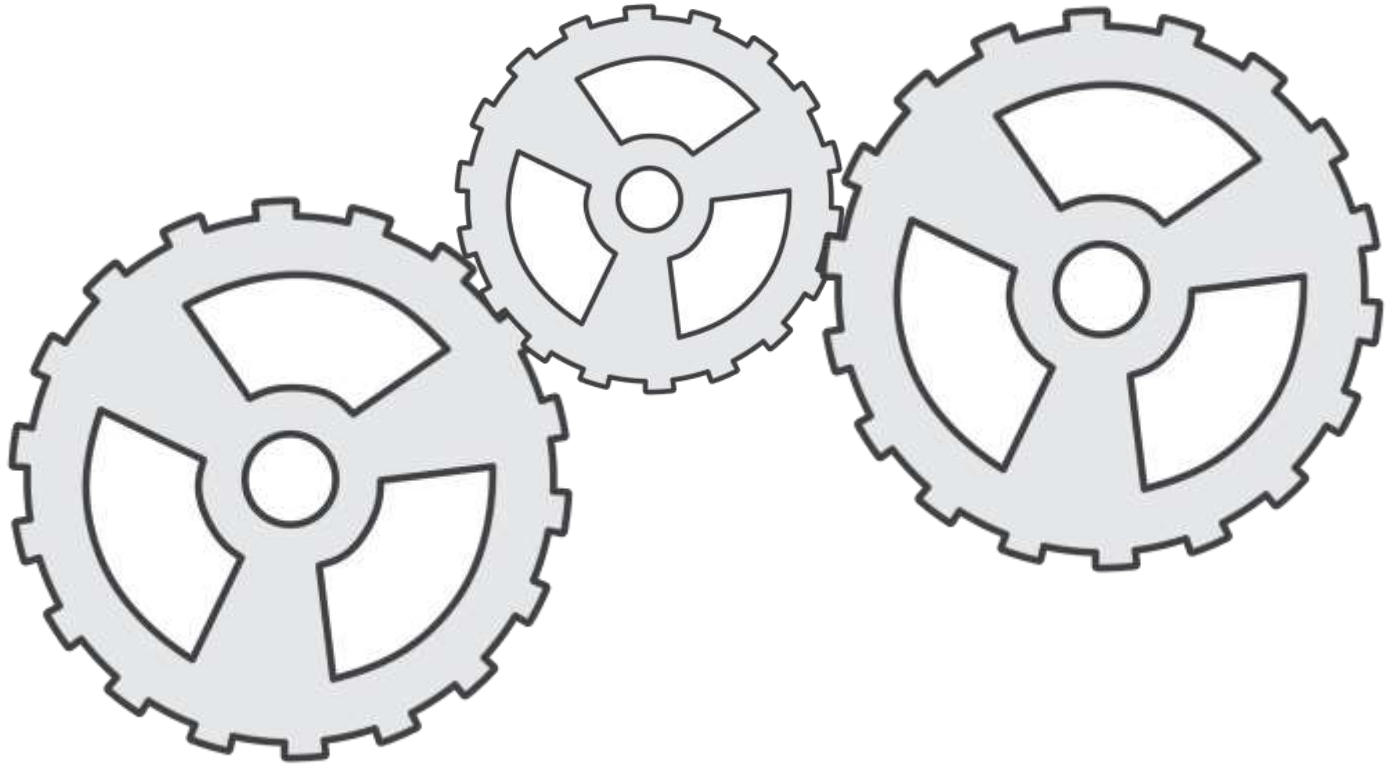
Database


Amazon RDS
Amazon Aurora


DynamoDB

Use automation





Application and Resource Management

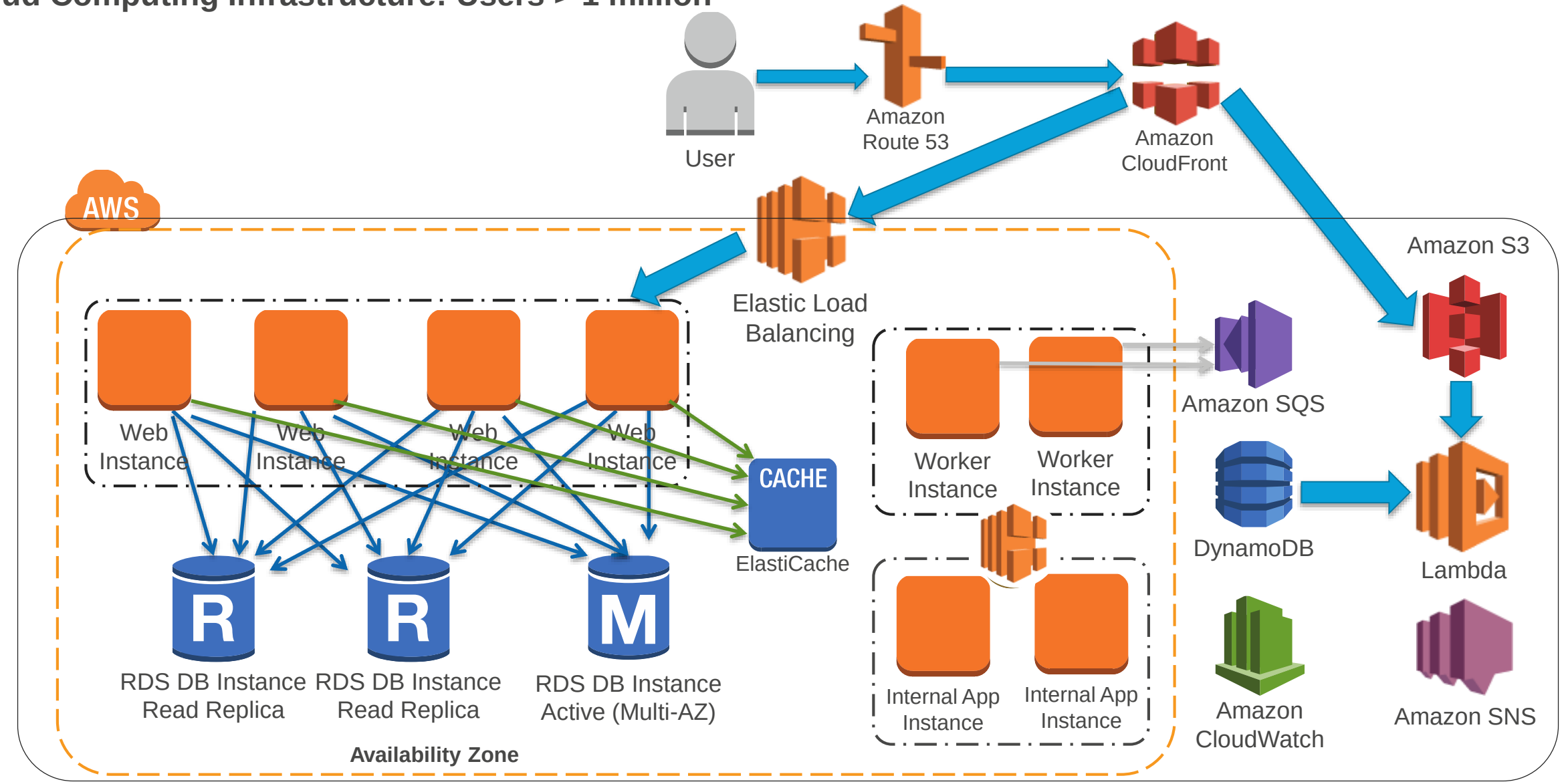
- Deploy code into the cloud
- Manage infrastructure
- Define infrastructure you want build

AWS Elastic Beanstalk

AWS OpsWorks

AWS CloudFormation

Cloud Computing Infrastructure: Users > 1 million



AWS Core Services Summary

Compute


Amazon EC2


Elastic Load Balancing


Auto Scaling


AWS Lambda

Networking


Amazon Route 53

Storage


Amazon S3


CloudFront

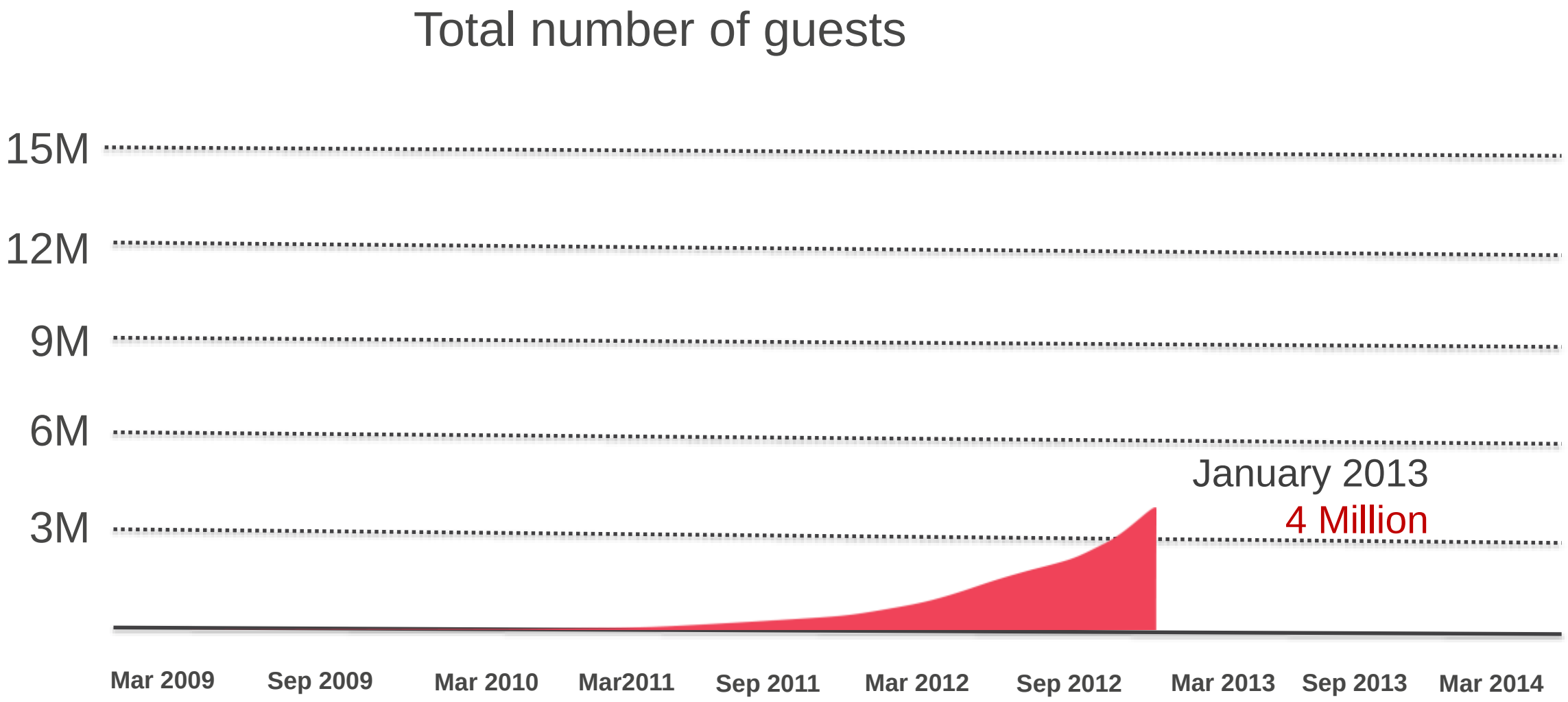
Database


Amazon RDS
Amazon Aurora

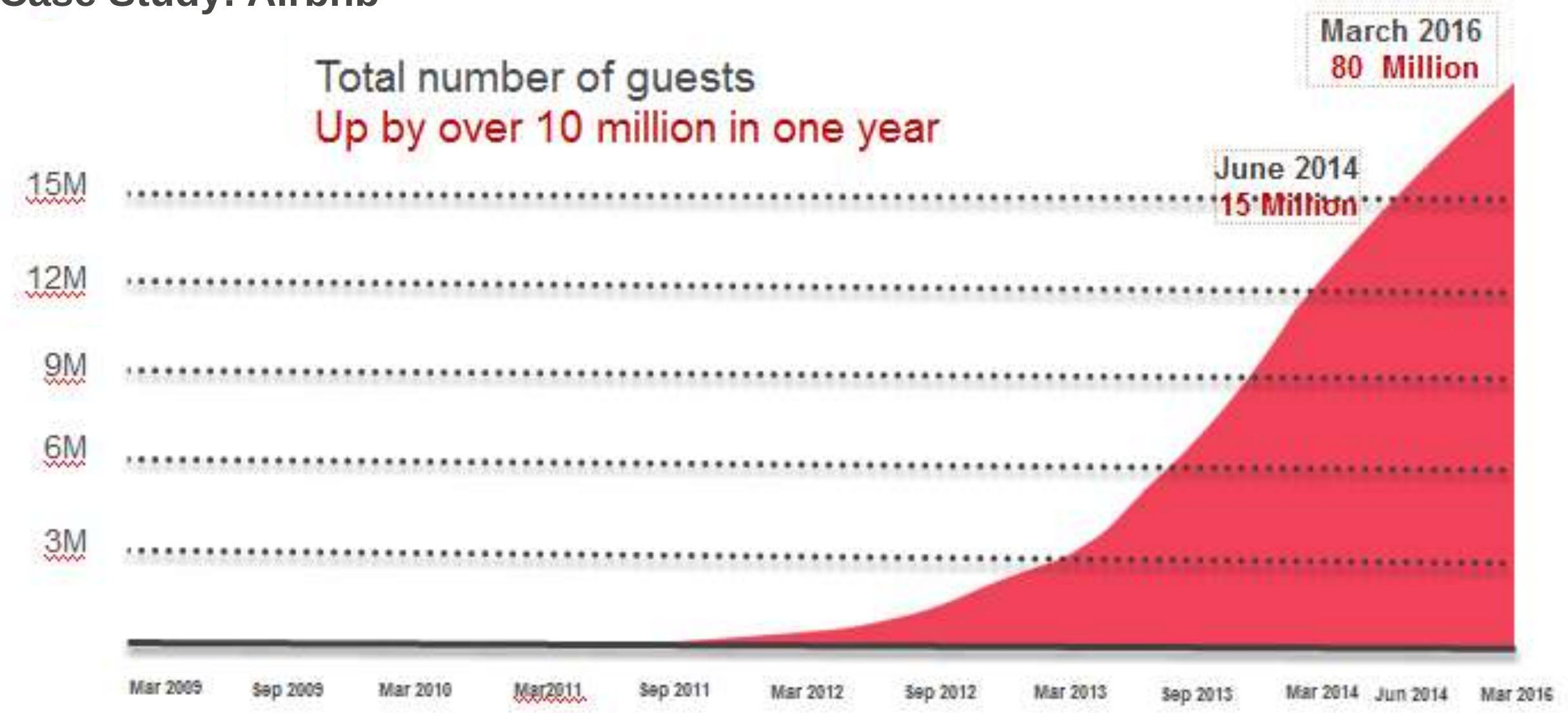

DynamoDB

Case Study: Airbnb

Case Study: Airbnb



Case Study: Airbnb



Key Takeaways

- What are the key features of the cloud computing infrastructure?
  - Elasticity
  - High availability
  - Security

Part 2 Big Data

- ✓Business challenges
- ✓Cloud computing solutions
- ✓The AWS big data services

Business Challenges

How is my marketing campaign performing?

Why is my most profitable region not growing?

Which devices are showing time for maintenance?

Who are my top customers and what are they buying?

Lots of data
Lots and lots of questions

Few insights

How much inventory do I have?

What is my product profitability by region?

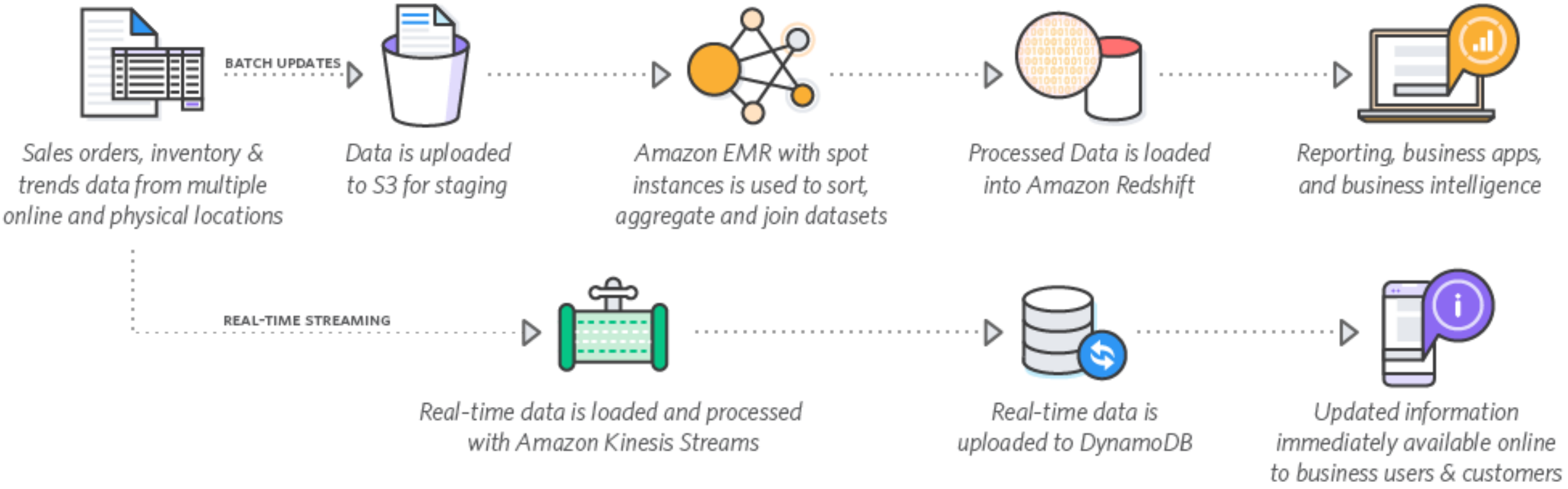
How is my employee satisfaction trending?

Has my fraud account expense increased?

A Natural Fit for Big Data

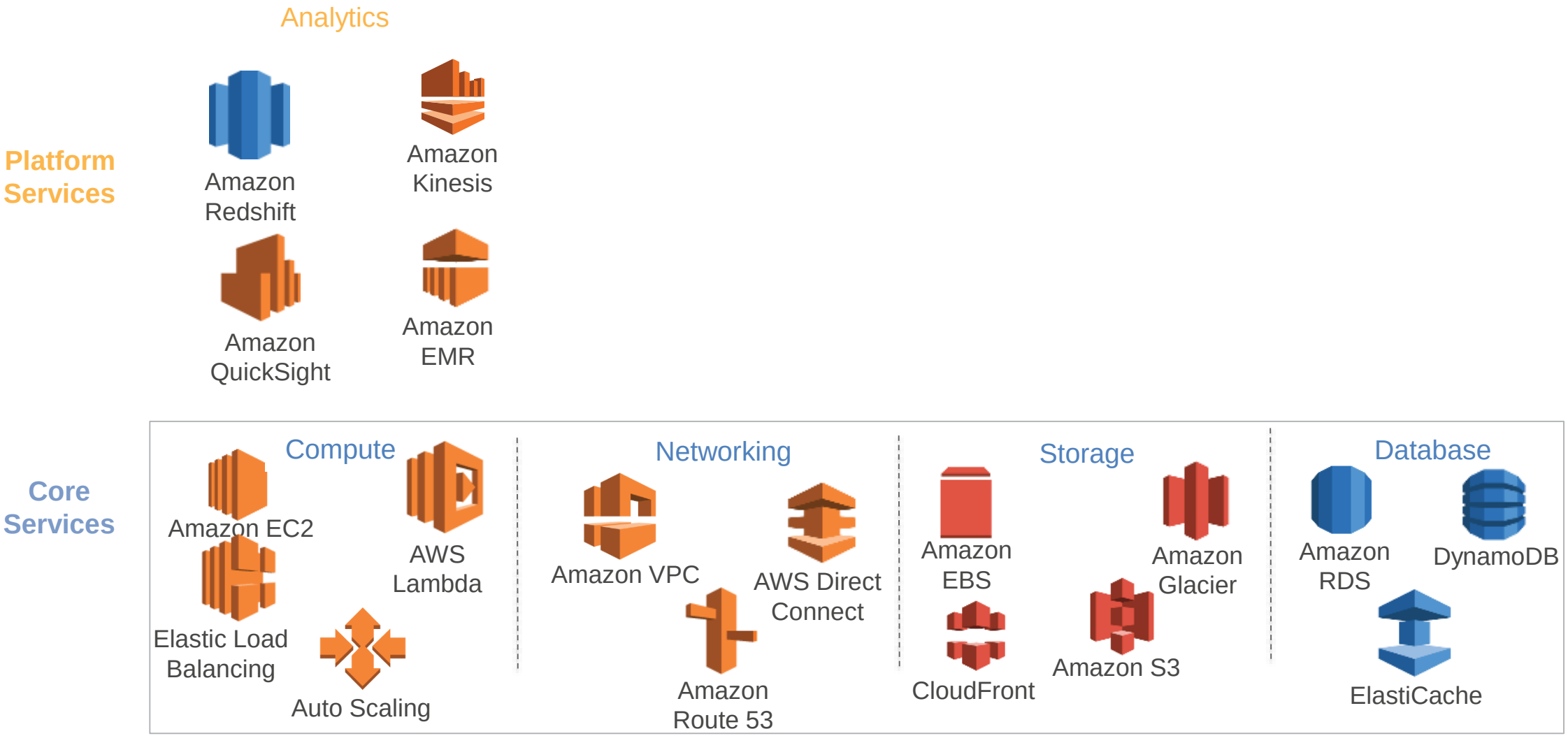
Big Data	AWS Cloud
Potentially massive data sets	Massive, virtually unlimited capacity
Iterative and experimental data analysis	On-demand infrastructure
Frequent peaks and valleys of workload	Elasticity
Structured and unstructured data	Tools and services for diverse data

Cloud Computing Solutions: On-Demand Analytics



Cloud Computing Solutions: Data Warehousing

AWS Services Summary



Part 3 Mobile

- ✓Business challenges
- ✓Cloud computing solutions
- ✓The AWS mobile services

Business Challenges

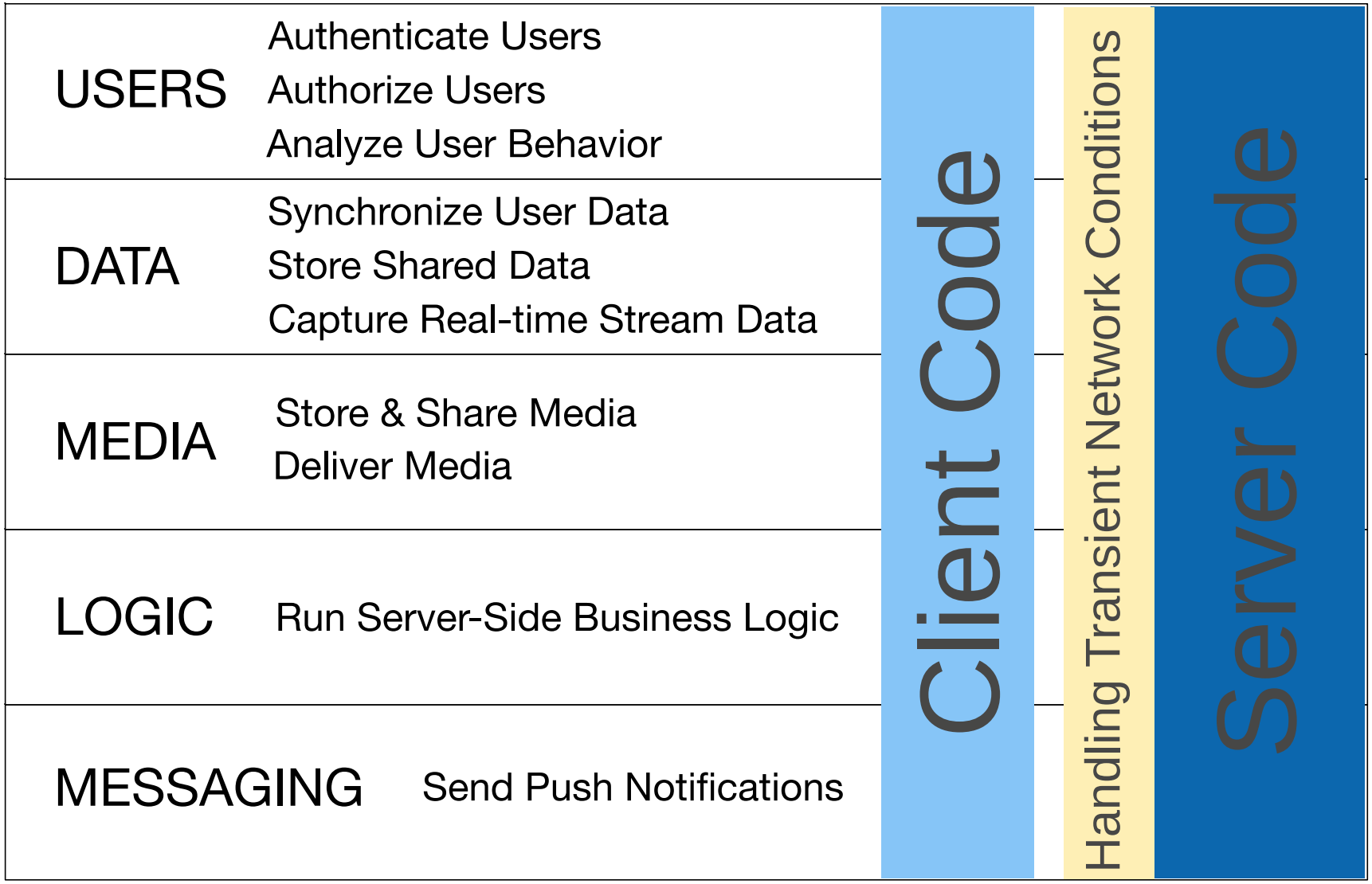
- What makes your mobile apps unique?
- Where are you spending most of your time?

- The undifferentiated heavy lifting that today's apps need
- The great stuff that makes your app unique

Undifferentiated Heavy Lifting

USERS	Authenticate Users Authorize Users Analyze User Behavior
DATA	Synchronize User Data Store Shared Data Capture Real-time Stream Data
MEDIA	Store & Share Media Deliver Media
LOGIC	Run Server-Side Business Logic
MESSAGING	Send Push Notifications

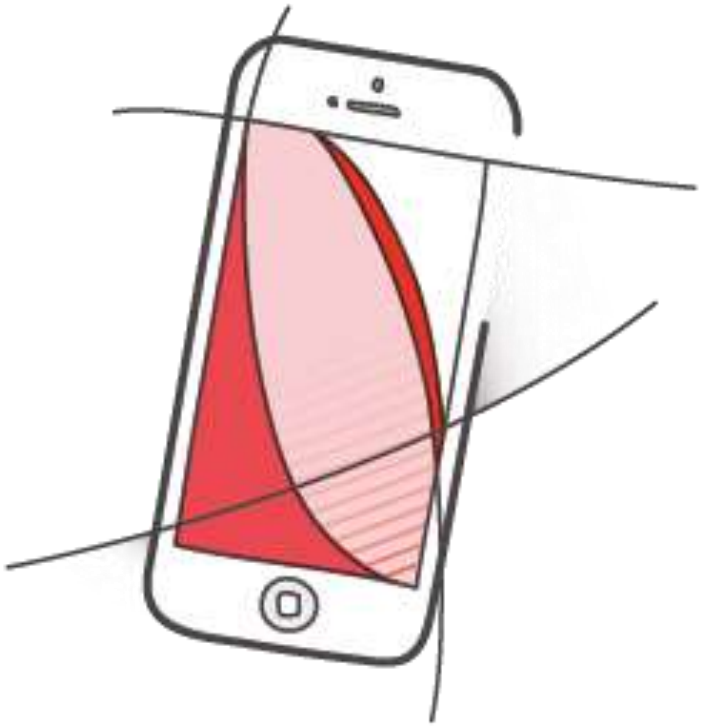
Undifferentiated Heavy Lifting



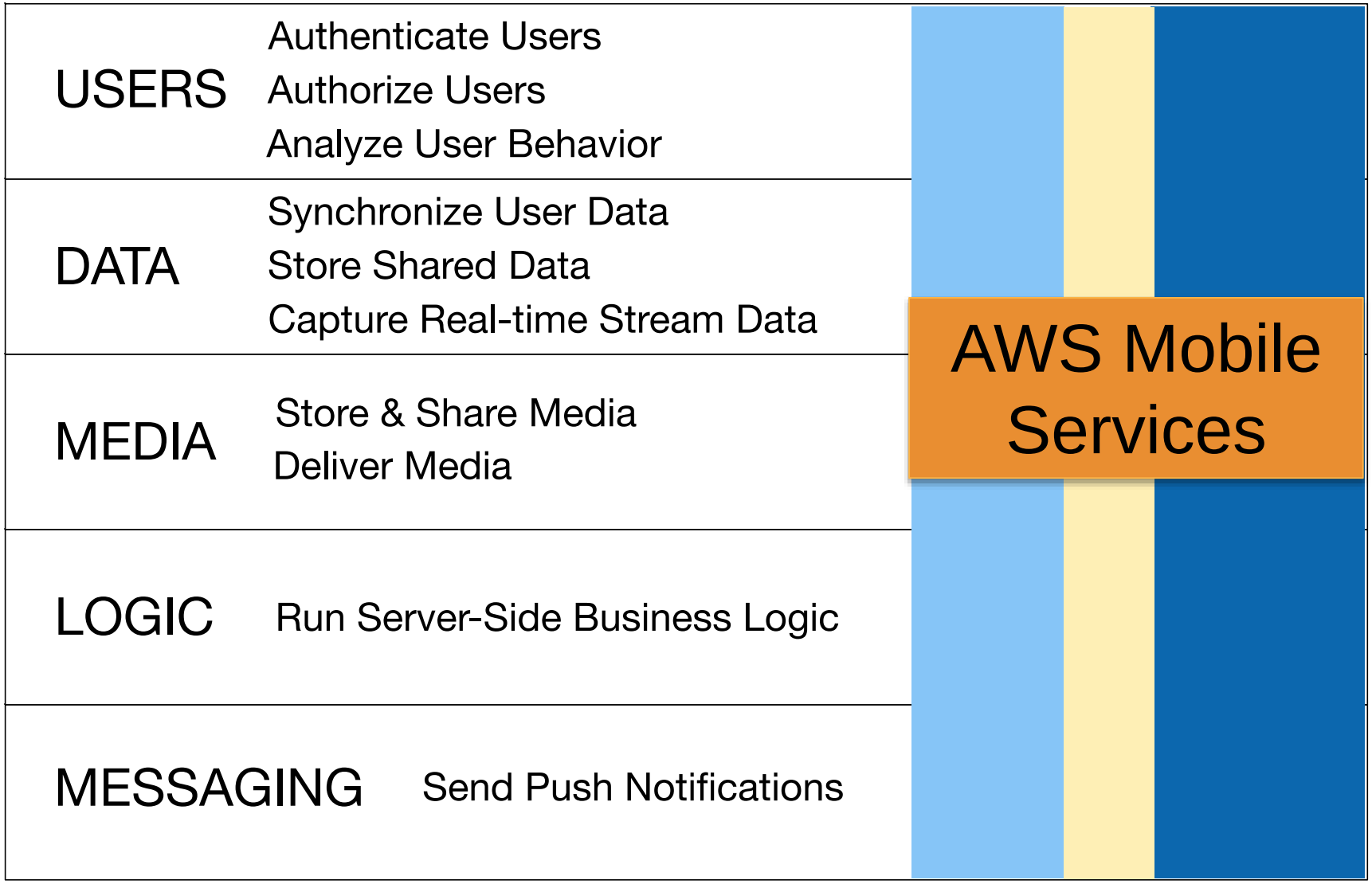
Cloud Computing Solutions

AWS Mobile Solutions make the undifferentiated heavy lifting easy.

You can focus on what makes your app unique!



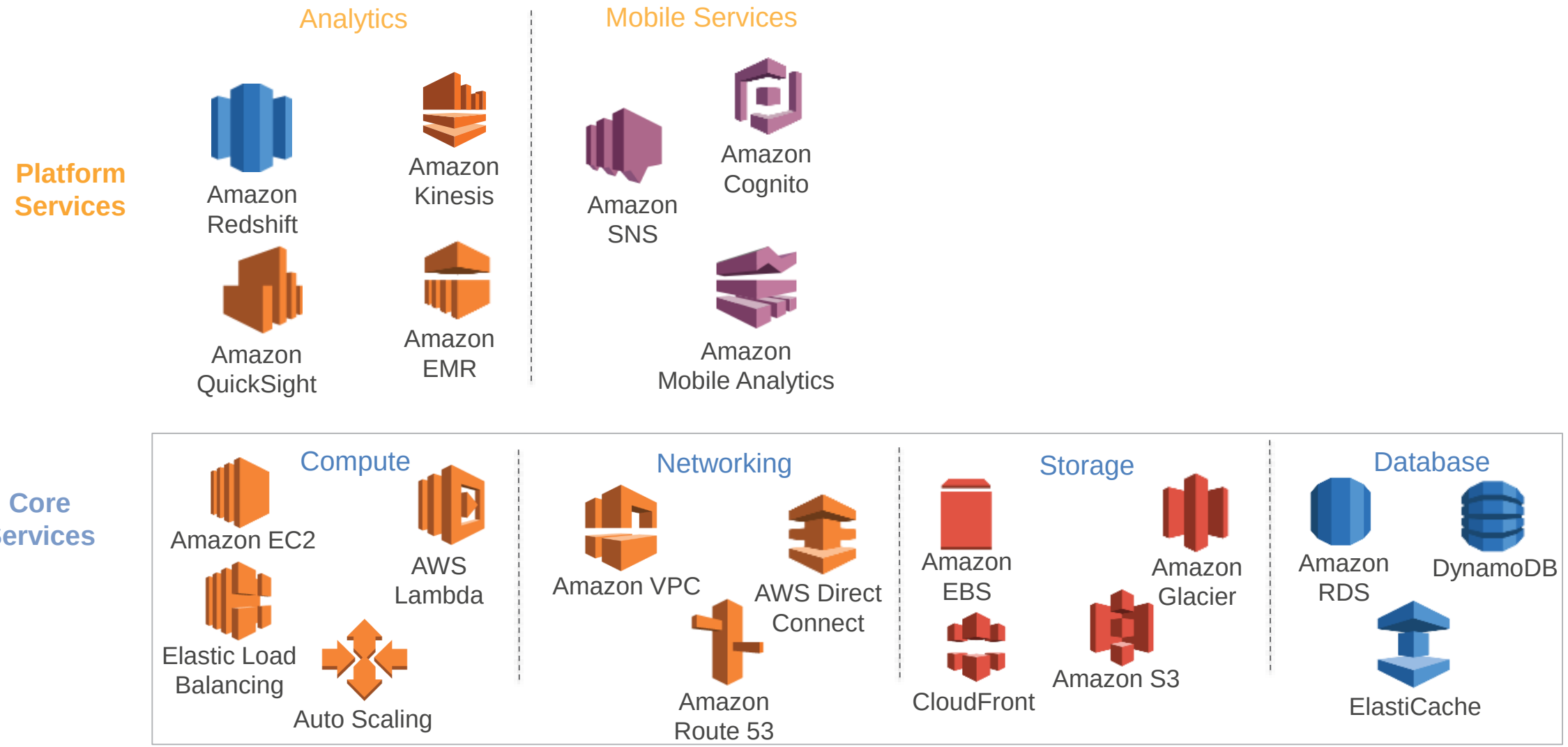
Cloud Computing Solutions



AWS Mobile Services

USERS	Authenticate Users Authorize Users Analyze User Behavior	 Amazon Cognito  Amazon Mobile Analytics  AWS IAM
DATA	Synchronize User Data Store Shared Data Capture Real-time Stream Data	 Amazon Kinesis Recorder  Amazon DynamoDB Object Mapper
MEDIA	Store & Share Media Deliver Media	 Amazon S3 Transfer Manager  Amazon CloudFront
LOGIC	Run Server-Side Business Logic	 AWS Lambda
MESSAGING	Send Push Notifications	 Amazon SNS

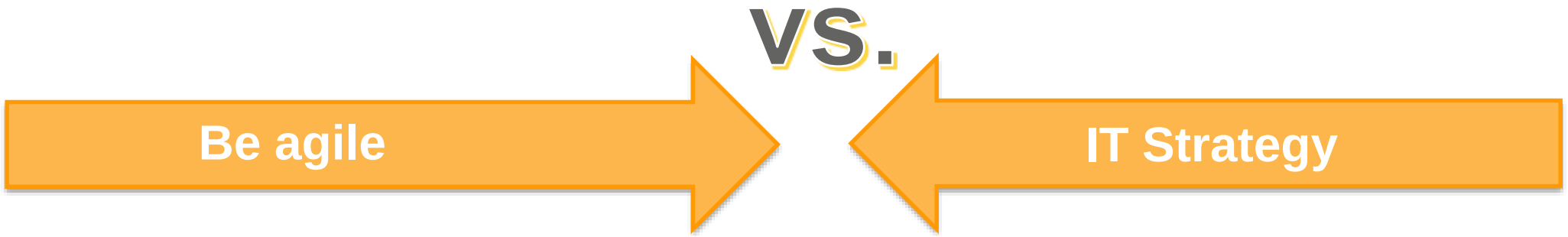
AWS Services Summary



Case Study: HTC

- Founded in 1997
- Global footprint
- Portfolio: smartphones and tablets
- Award-winning mobile devices and industry firsts

Case Study: HTC – Challenges



- Rapid release cycle
- Unpredictable consumer response
- Worldwide deployment

- Need someone do it better and more efficiently

Case Study: HTC – Solutions

- Manage and move terabytes of customer data every day.
- Help the CS team with capacity management.
- Improve the customer content viewing experience.
- Manage user data.
- Use multiple AZs: in North America, Europe, and Asia.
- Monitor.


Amazon EC2


Amazon S3


Auto Scaling


AWS CloudFormation


CloudFront


DynamoDB


Amazon VPC


Amazon EBS


Amazon SNS


Amazon SES


Elastic Load Balancing


Amazon Route 53


Amazon CloudWatch

Case Study: HTC – Results

- Became more flexible and agile, even with tight release cycles.
- Time to market has improved.
- Reacted quickly to the rapid user growth in HTC Share Service.
- Provided a good customer experience: reducing latency; improving availability.

Part 4 Disaster Recovery

- ✓Business challenges
- ✓Cloud computing solutions
- ✓The AWS Services for disaster recovery

Business Challenges

Business continuity is broken

Hardware or software failure

Network outage, power outage

Physical damage to a building

Human error

…

Business Challenges

Traditional Environment vs. AWS

Traditional Environment

- Duplication of infrastructure
- Large procurements
- Ongoing maintenance
- Underutilized resources

AWS

- Scale infrastructure up and down
- Provision resources globally
- Change and optimize resources during a DR scenario
- Tools for segregation of duties
- Automate deployment

Business Challenges

Traditional Environment vs. AWS

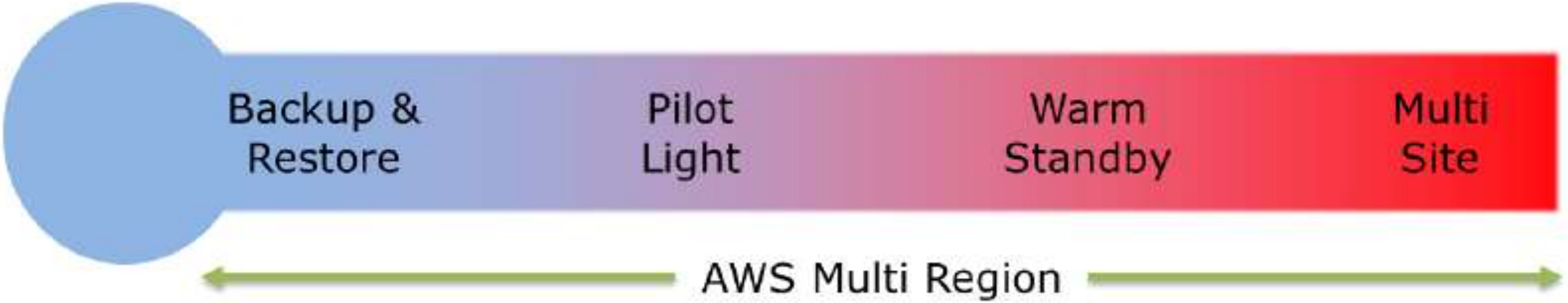
Traditional Environment

- Duplication of infrastructure
- Large procurements
- Ongoing maintenance
- Underutilized resources

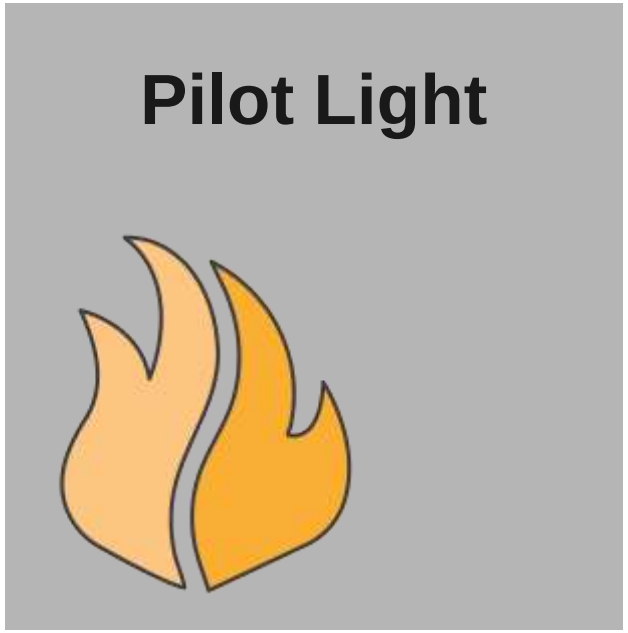
AWS

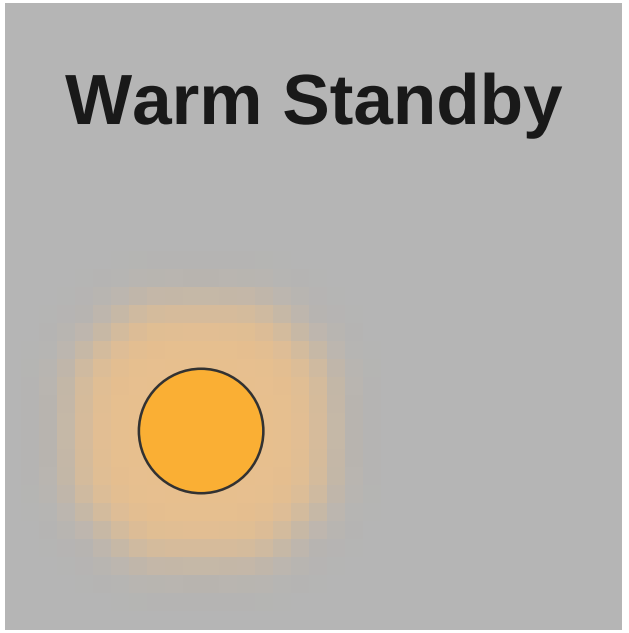
- Scale infrastructure up and down
- Change and optimize resources during a DR scenario
- Automate deployment
- **Provision resources globally**
- **Fast!**

Cloud Computing Solutions for DR



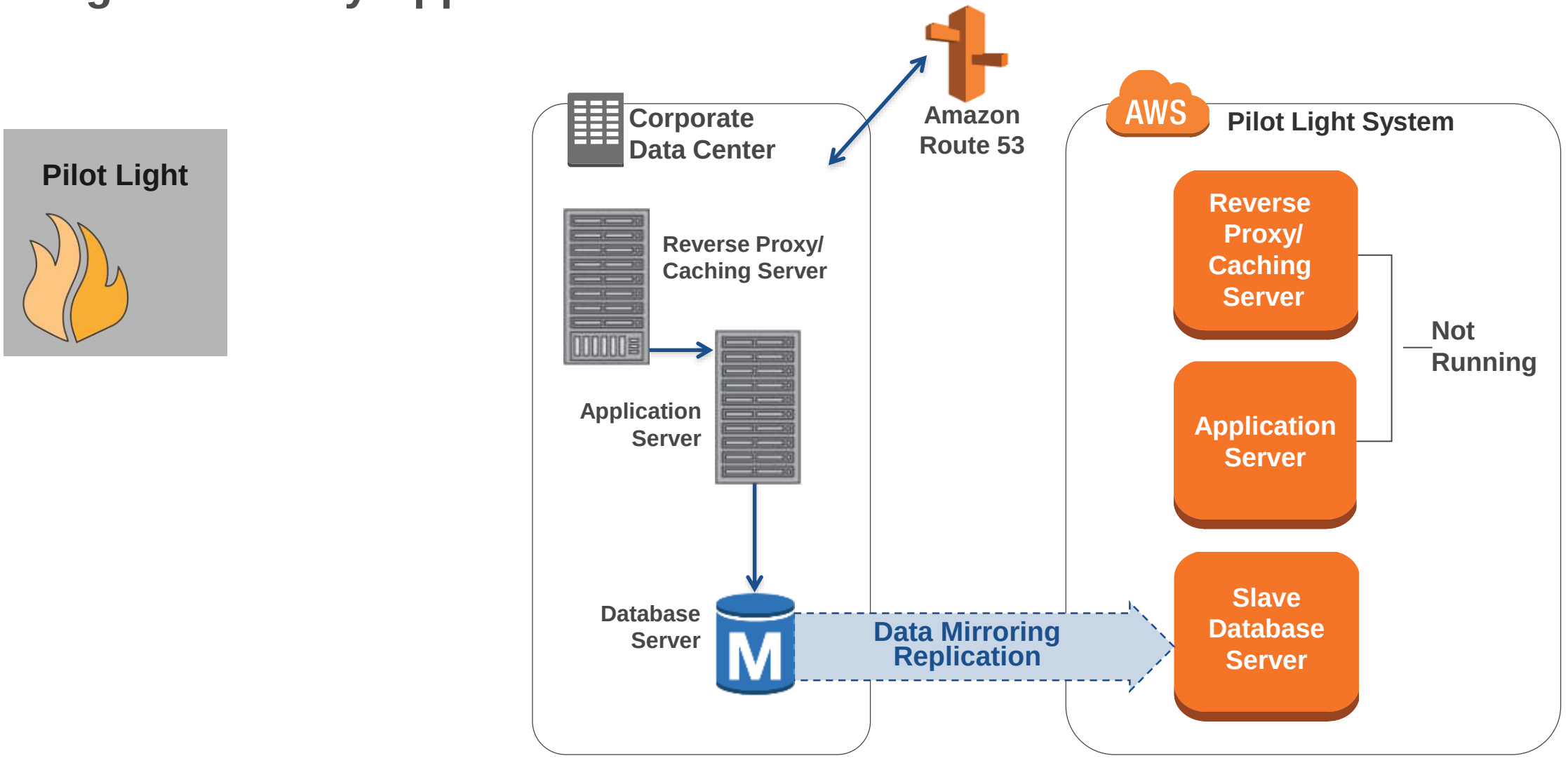
DR Approaches: Pilot Light and Warm Standby





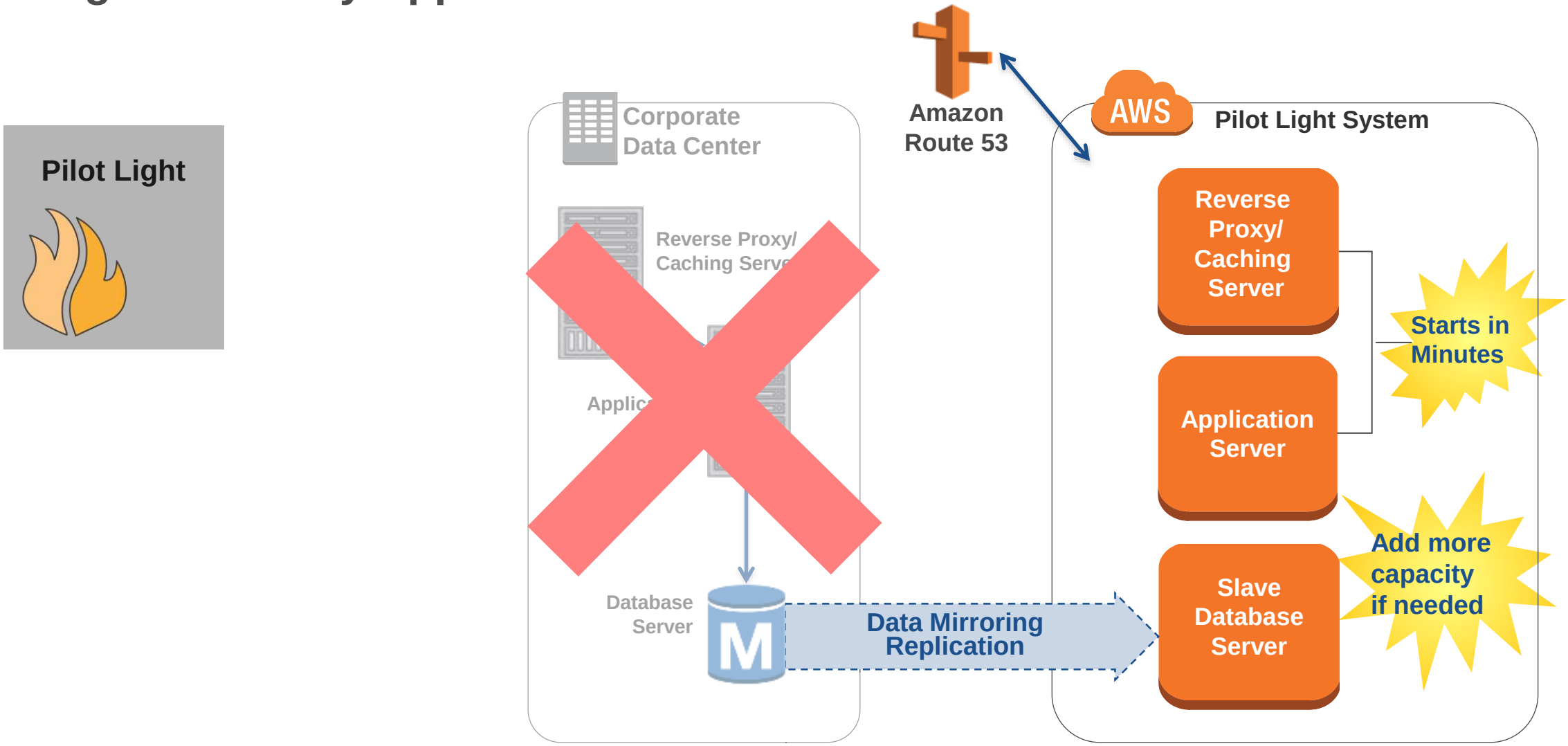
Pilot Light Recovery Approach

Pilot Light

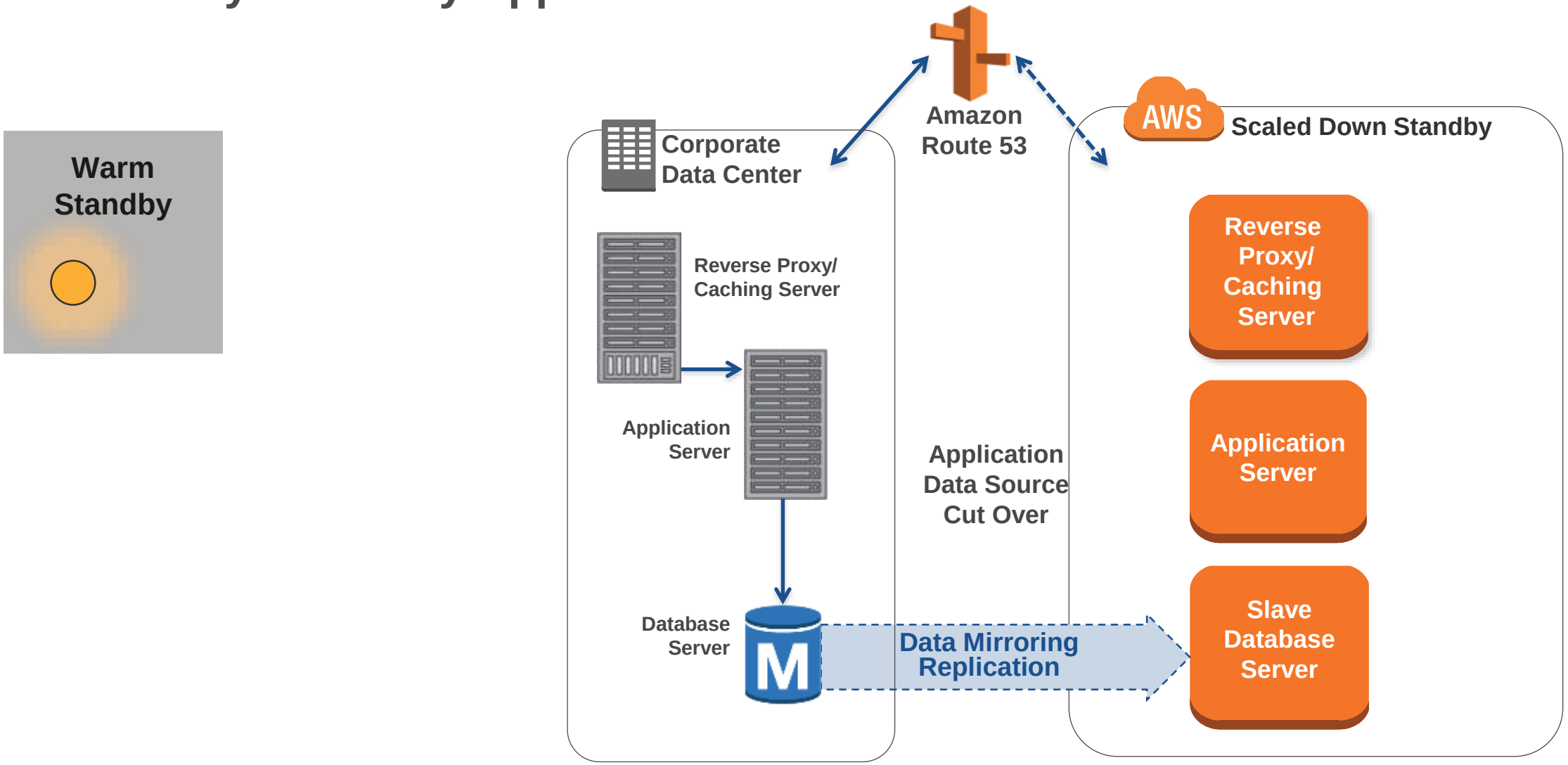


Pilot Light Recovery Approach

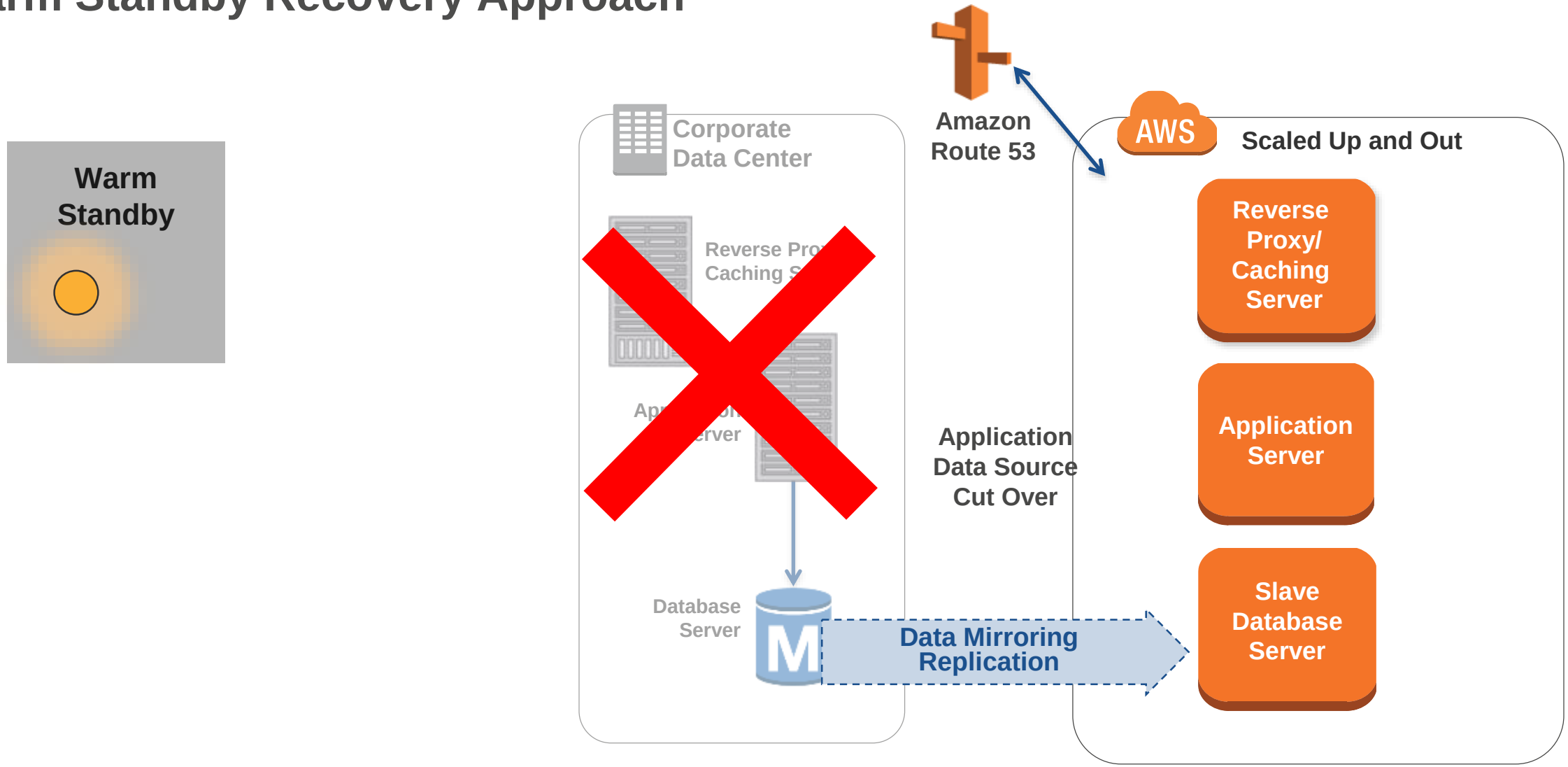
Pilot Light



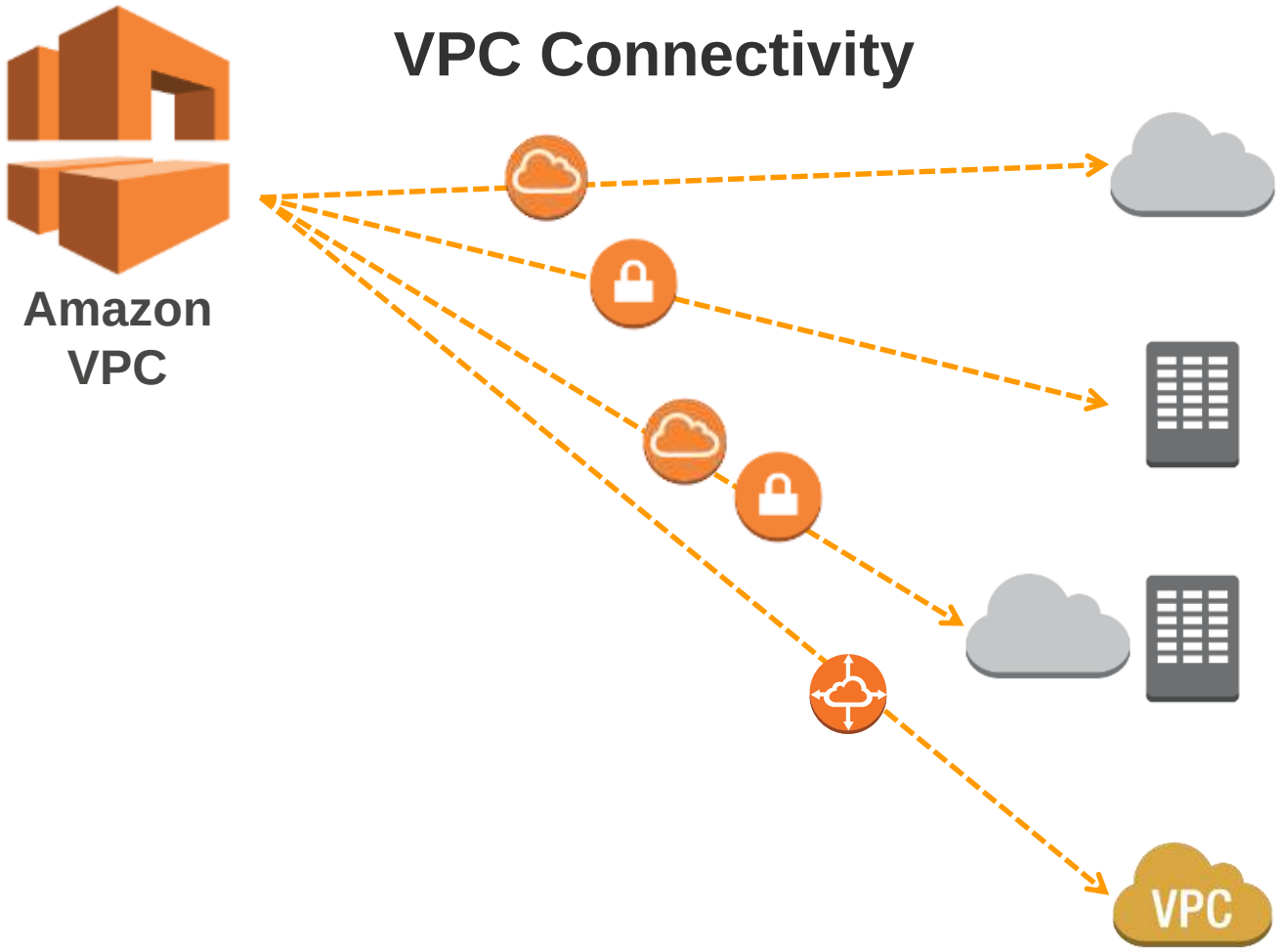
Warm Standby Recovery Approach



Warm Standby Recovery Approach



AWS Networking Services: Amazon Virtual Private Cloud



Gateway Connections:

Internet Gateway

Virtual Private Gateway

Internet Gateway and Virtual Private Gateway

VPC Peering Connections

AWS Services Summary

Platform Services

Analytics


Amazon Redshift


Amazon Kinesis


Amazon QuickSight


Amazon EMR

Mobile Services


Amazon SNS


Amazon Cognito


Amazon Mobile Analytics

Deployment and Management


AWS OpsWorks


AWS CloudFormation


IAM


CloudWatch


AWS CloudTrail

Core Services

Compute


Amazon EC2


AWS Lambda


Elastic Load Balancing


Auto Scaling

Networking


Amazon VPC


AWS Direct Connect


Amazon Route 53

Storage


Amazon EBS


Amazon Glacier


CloudFront


Amazon S3

Database


Amazon RDS


DynamoDB


ElastiCache

AWS Business Essentials

Module 1: Getting Started with the Cloud

Module 2: Leveraging AWS for Competitive Advantages

Module 3: Cloud Economics

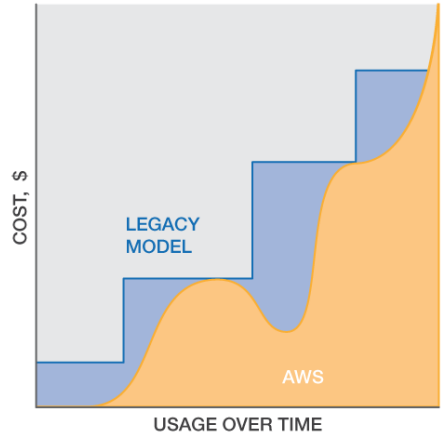
Module 4: Security and Compliance

Module 5: Migrating to the Cloud

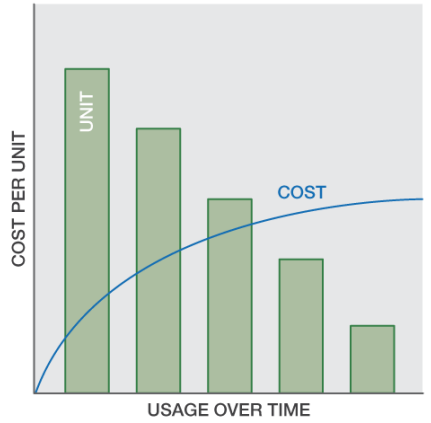
What's in Module 3

- AWS pricing principles
- The simple monthly calculator
- TCO
- Cost optimization

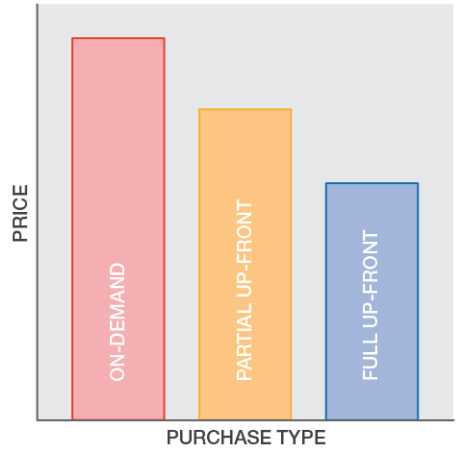
Four Basic Principles



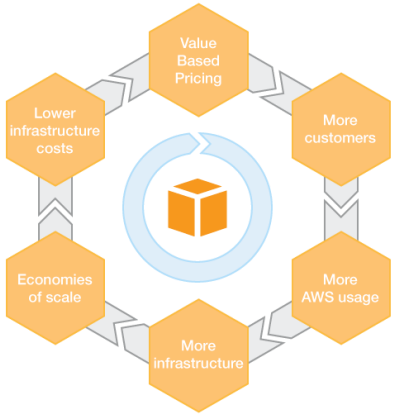
Pay as you go



Pay less per unit by using more

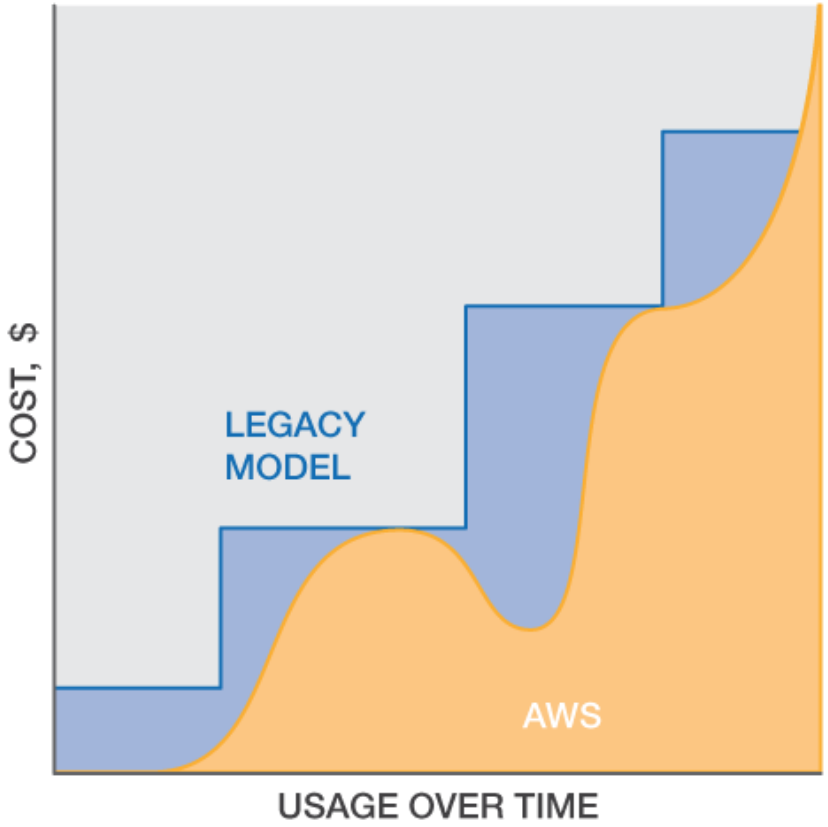


Pay less when you reserve



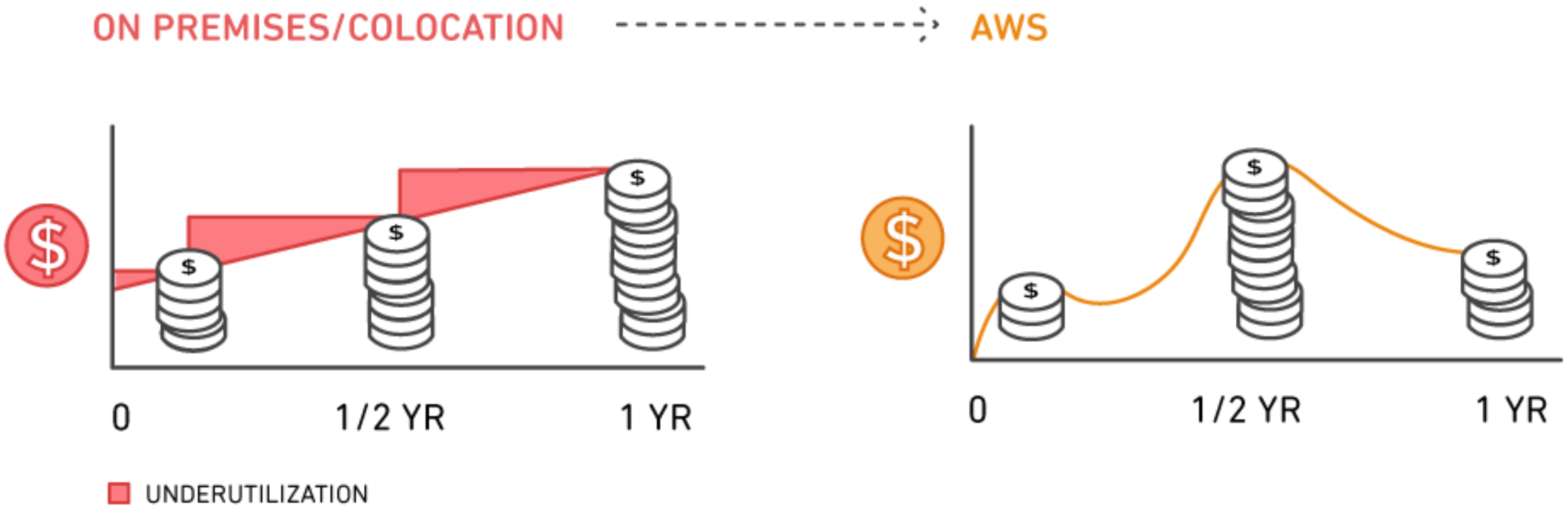
Benefit from AWS Economies of Scale

❶ Pay As You Go

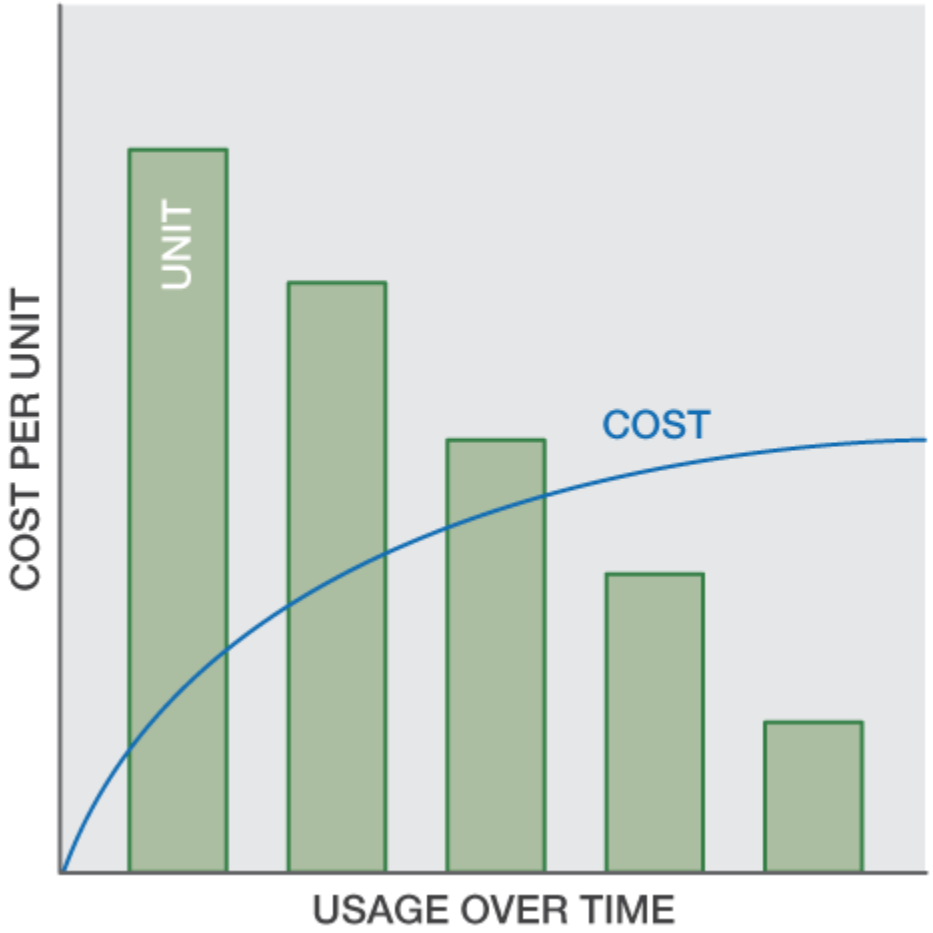


- No minimum commitments or long-term contracts
- No upfront expense
- Low variable costs
- Pay only for what you use

❶ Pay As You Go

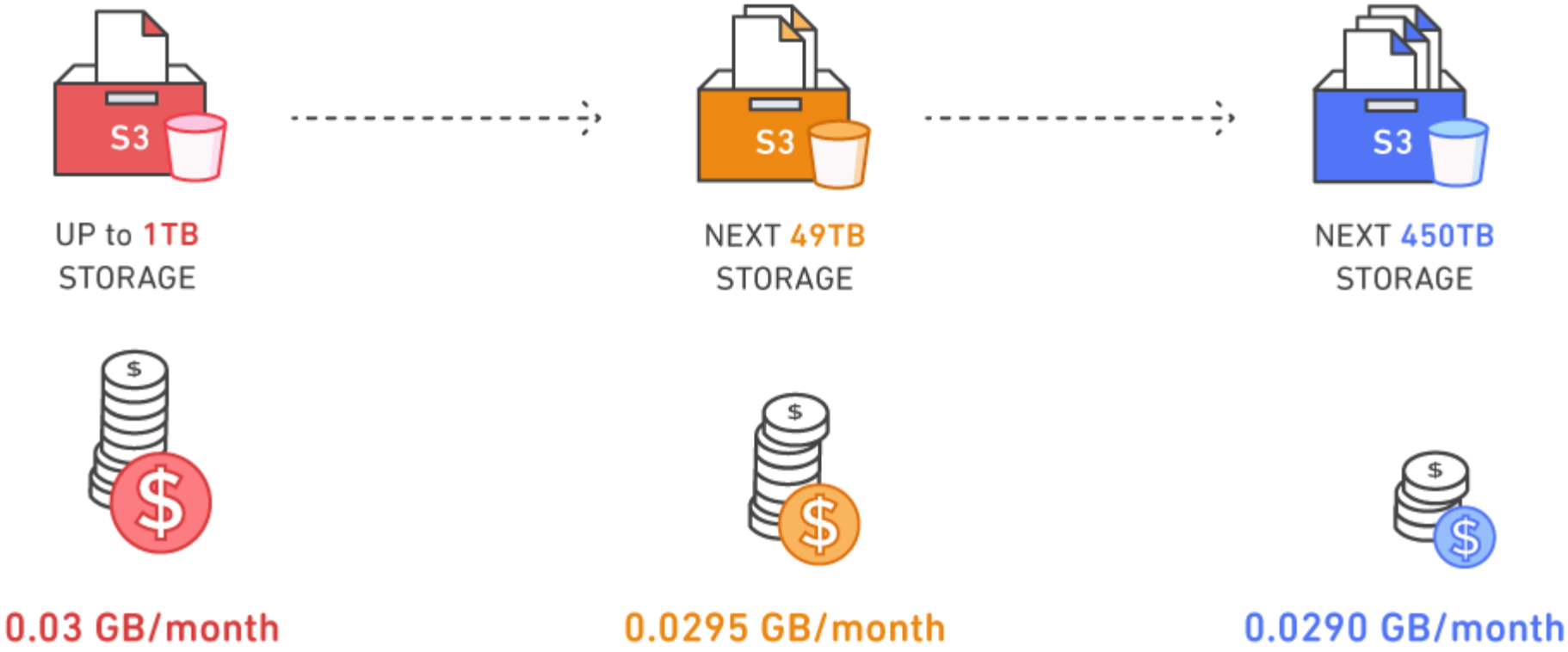


❷ Pay Less per Unit by Using More

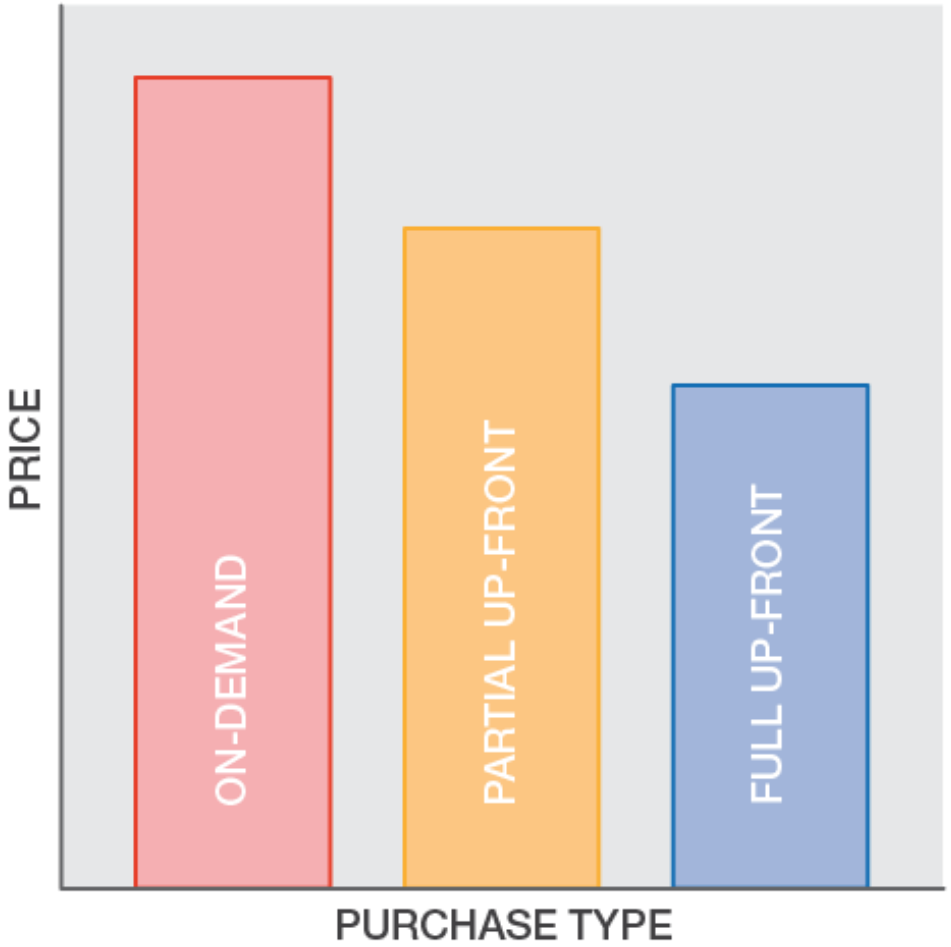


- Save more as your usage grows
- Pay less per GB
- Get volume discounts by reserving more

❷ Pay Less per Unit by Using More

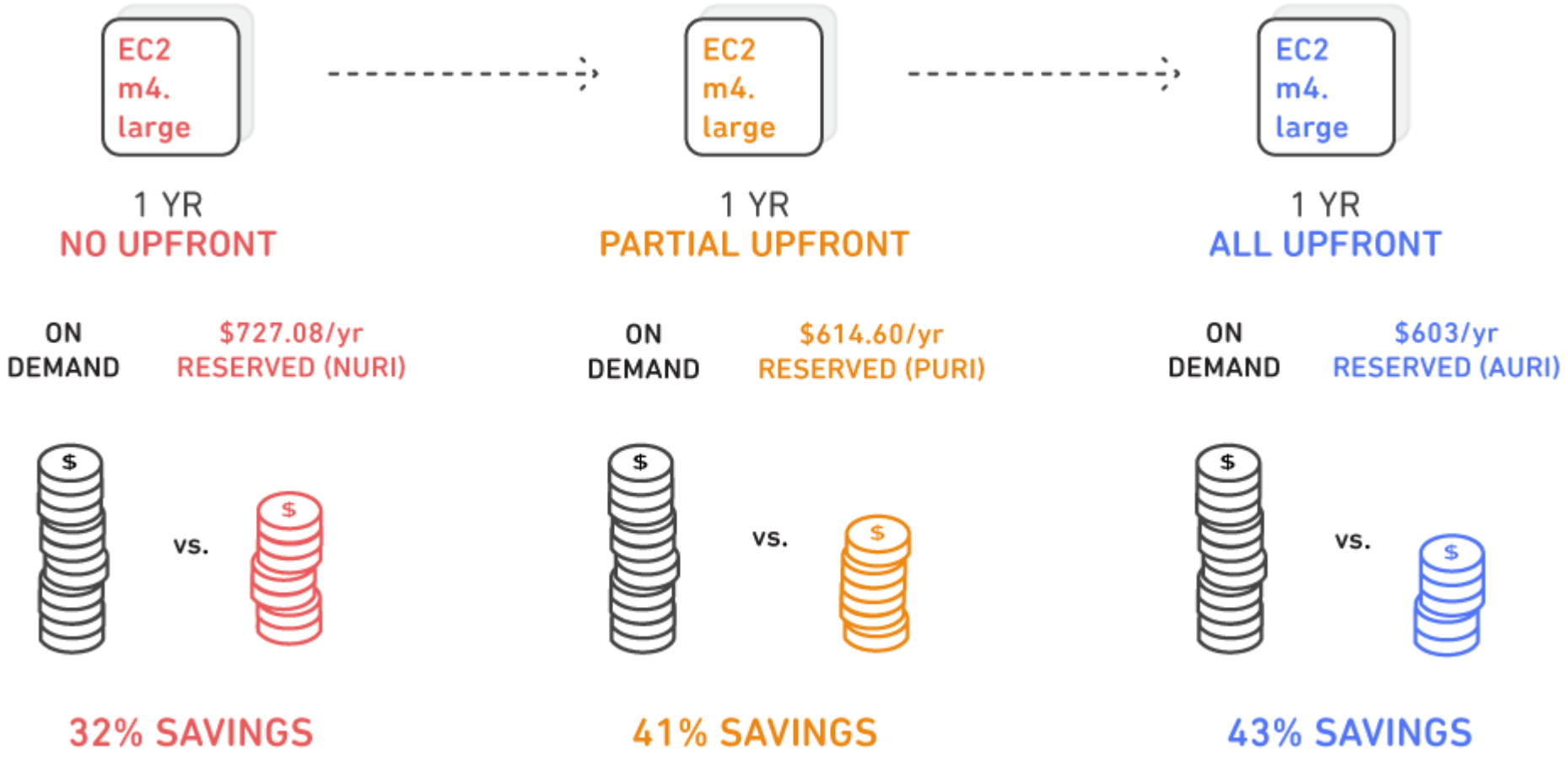


❸ Pay Less When You Reserve



- Get a bigger discount when you pay more upfront
- Get a significantly discounted hourly rate
- Overall savings of up to 75%

❸ Pay Less When You Reserve



Pricing Principles for Compute

Optimize and combine purchase types:

On-Demand

Spiky workloads

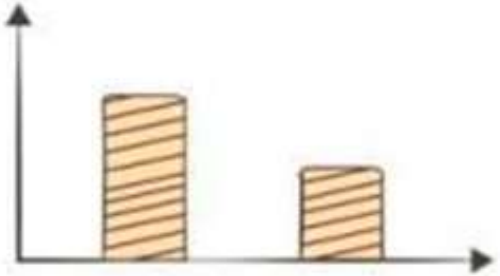
- Pay by the hour
- No long-term commitments

Reserved

Steady-state workloads

- Pay upfront
- 50-75% lower hourly rate

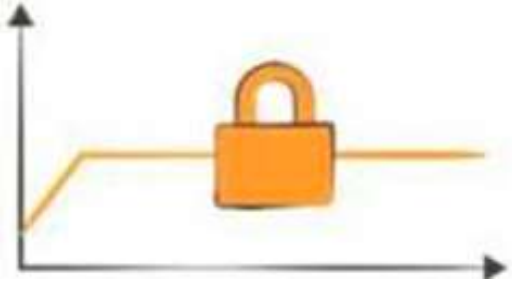
Spot



Time-insensitive workloads

- Bid for unused EC2 capacity

Dedicated

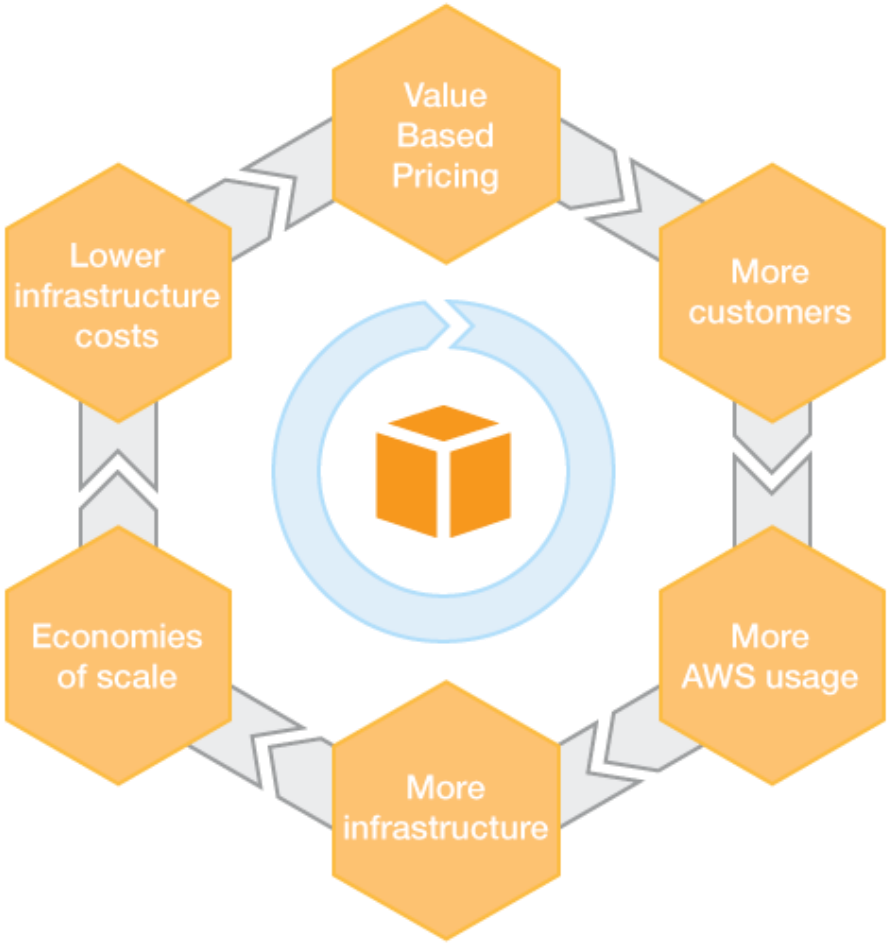


Highly sensitive workloads

- Isolated, steady-state workloads

Free Tier: Get started on AWS with free usage & no commitment.

❹ Benefit from AWS Economies of Scale

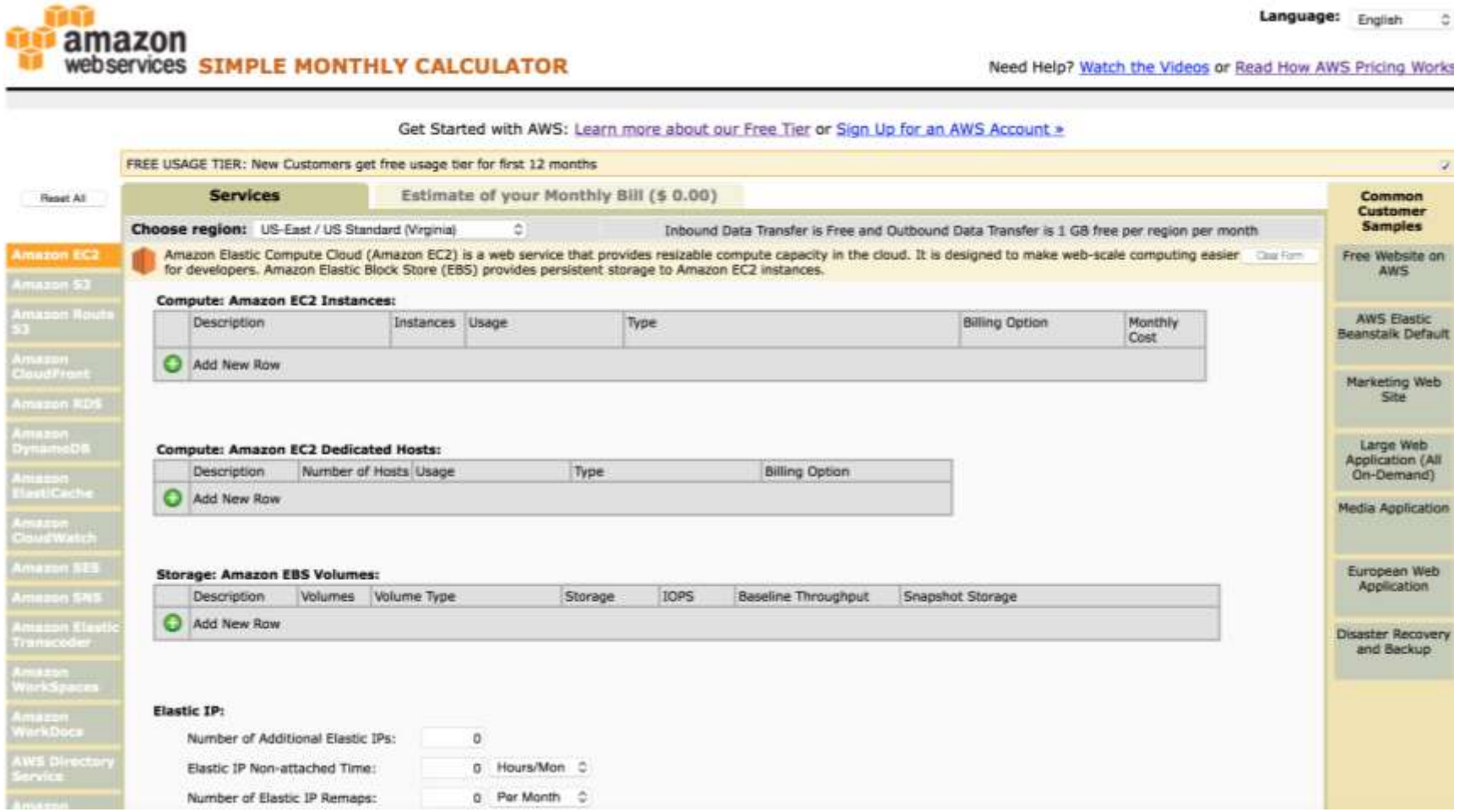


- Lower price and more customers/usage
- Lower cost and continuous innovation
- Lower prices

What's in Module 3

- AWS pricing principles
- The simple monthly calculator
- TCO
- Cost optimization

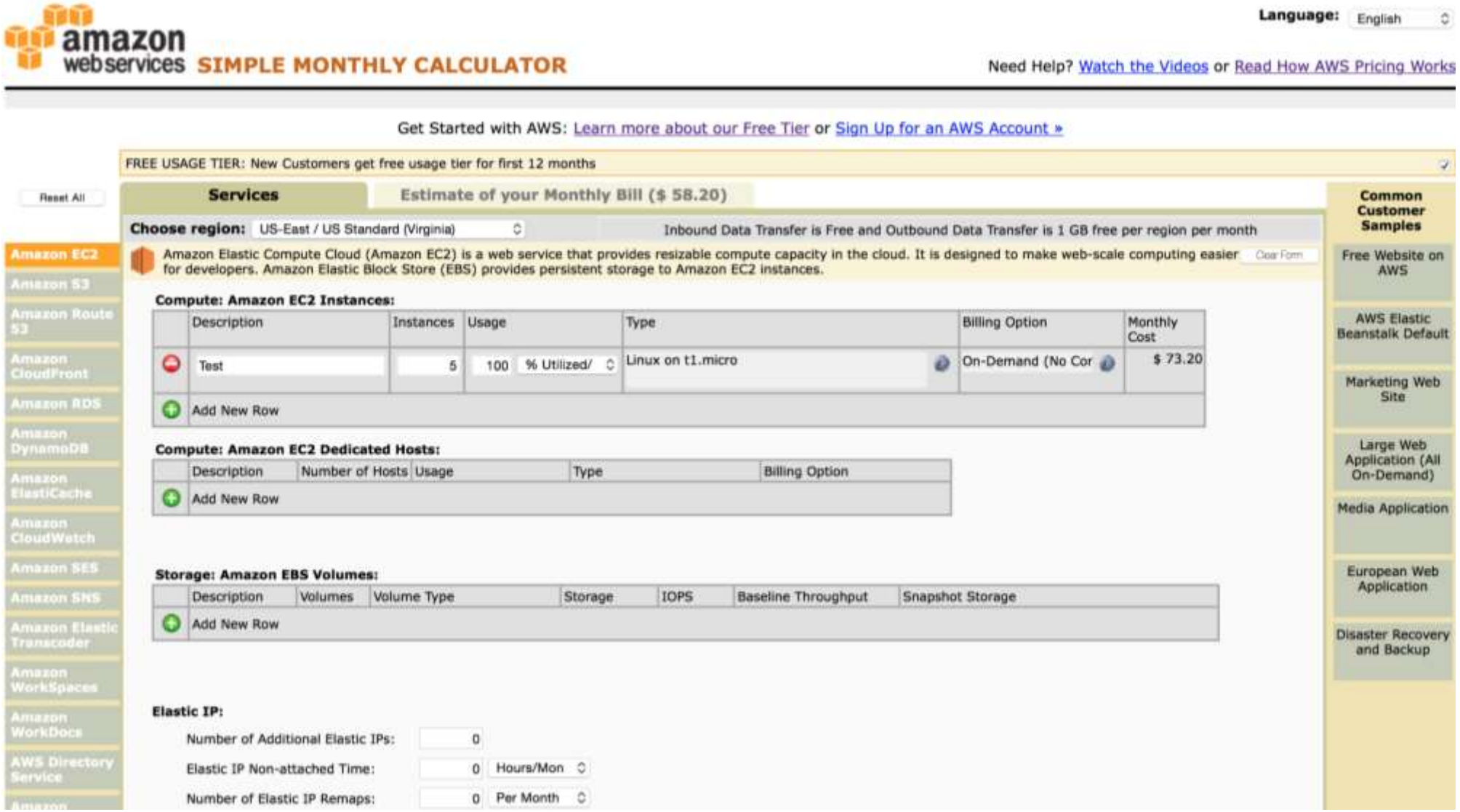
The Simple Monthly Calculator



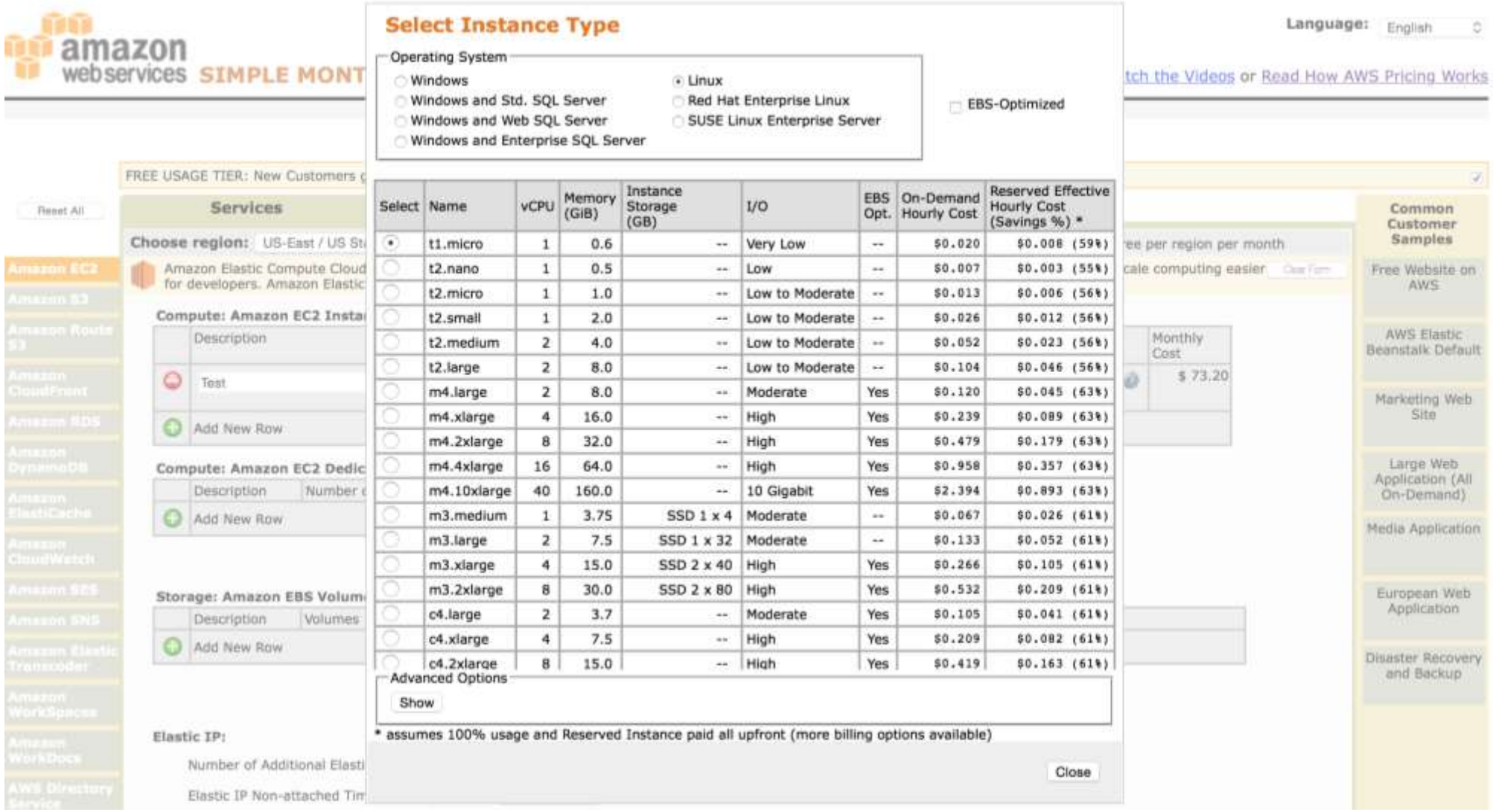
http://calculator.s3.amazonaws.com/index.html

- A tool to estimate price for numerous AWS services
- Estimate monthly bill
  - A single instance
  - Individual services
  - Individual or multiple prices
- Appraise complete solutions
  - Templates

Single Service Pricing – EC2

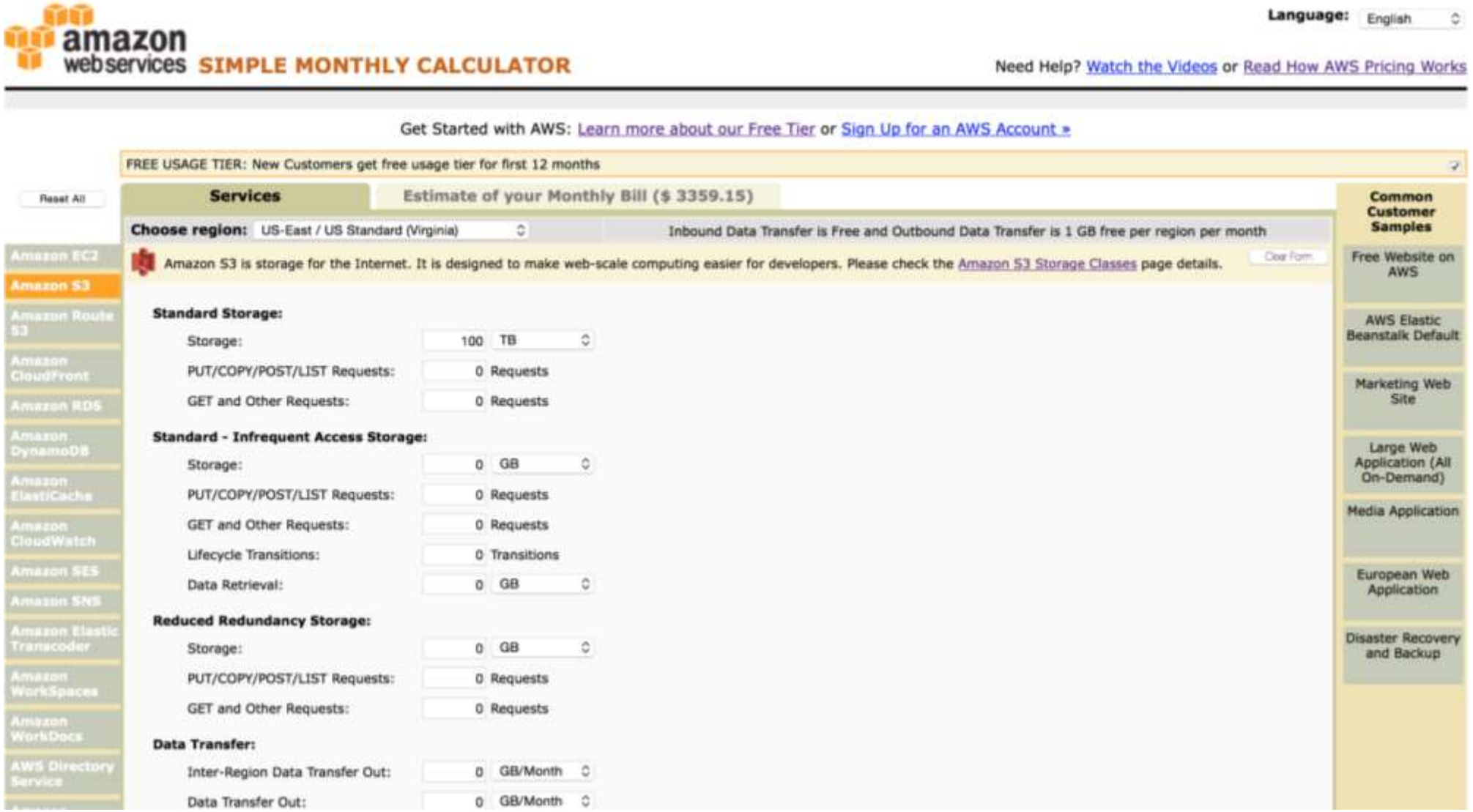


Single Service with Price Window



Select	Name	vCPU	Memory (GiB)	Instance Storage (GB)	I/O	EBS Opt.	On-Demand Hourly Cost	Reserved Effective Hourly Cost (Savings %) *
•	t1.micro	1	0.6	--	Very Low	--	$0.020	$0.008 (59%)
	t2.nano	1	0.5	--	Low	--	$0.007	$0.003 (55%)
	t2.micro	1	1.0	--	Low to Moderate	--	$0.013	$0.006 (56%)
	t2.small	1	2.0	--	Low to Moderate	--	$0.026	$0.012 (56%)
	t2.medium	2	4.0	--	Low to Moderate	--	$0.052	$0.023 (56%)
	t2.large	2	8.0	--	Low to Moderate	--	$0.104	$0.046 (56%)
	m4.large	2	8.0	--	Moderate	Yes	$0.120	$0.045 (63%)
	m4.xlarge	4	16.0	--	High	Yes	$0.239	$0.089 (63%)
	m4.2xlarge	8	32.0	--	High	Yes	$0.479	$0.179 (63%)
	m4.4xlarge	16	64.0	--	High	Yes	$0.958	$0.357 (63%)
	m4.10xlarge	40	160.0	--	10 Gigabit	Yes	$2.394	$0.893 (63%)
	m3.medium	1	3.75	SSD 1 x 4	Moderate	--	$0.067	$0.026 (61%)
	m3.large	2	7.5	SSD 1 x 32	Moderate	--	$0.133	$0.052 (61%)
	m3.xlarge	4	15.0	SSD 2 x 40	High	Yes	$0.266	$0.105 (61%)
	m3.2xlarge	8	30.0	SSD 2 x 80	High	Yes	$0.532	$0.209 (61%)
	c4.large	2	3.7	--	Moderate	Yes	$0.105	$0.041 (61%)
	c4.xlarge	4	7.5	--	High	Yes	$0.209	$0.082 (61%)
	c4.2xlarge	8	15.0	--	High	Yes	$0.419	$0.163 (61%)

Add A Second Service – Amazon S3



What's in Module 3

- AWS pricing principles
- The simple monthly calculator
- TCO
- Cost optimization

What Is TCO?

***Comparative* total cost of ownership analysis**

1) On-premises/co-location vs. on AWS

2) Acquisition cost + operating costs

3) Entire infrastructure environment or specific workload

Not Easy to Compare!

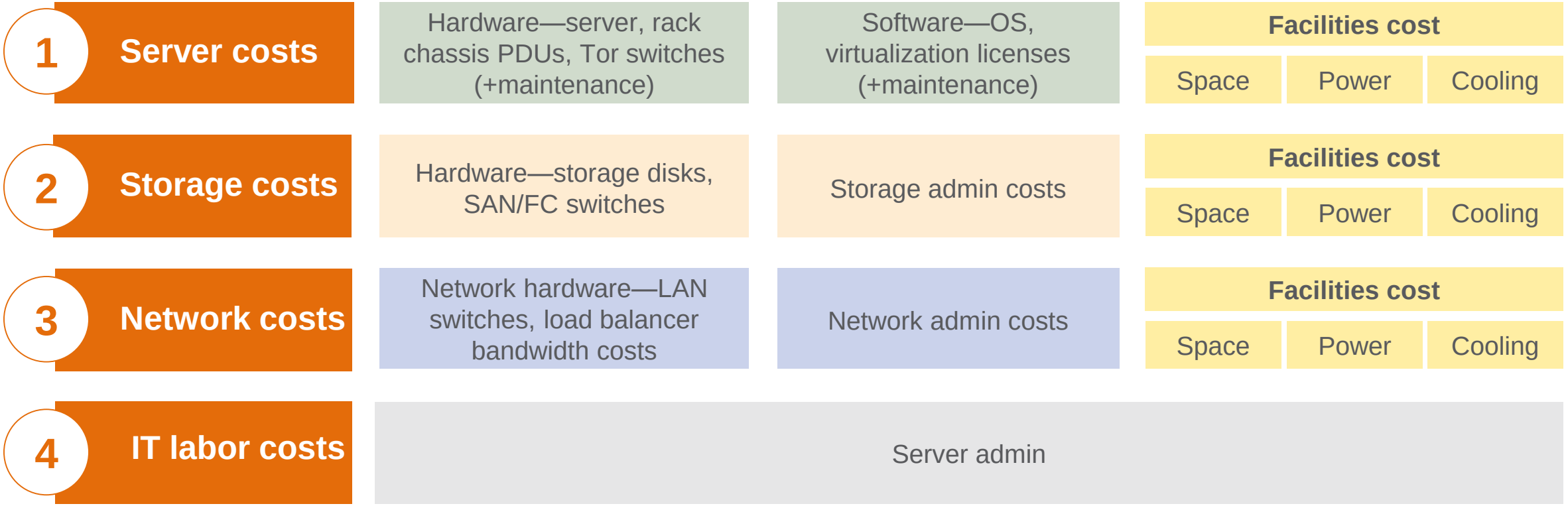
On-premises/co-location

≠

amazon web services

Costs Involved in Data Center Maintenance

illustrative



Resources to Get You Started

AWS TCO Calculator

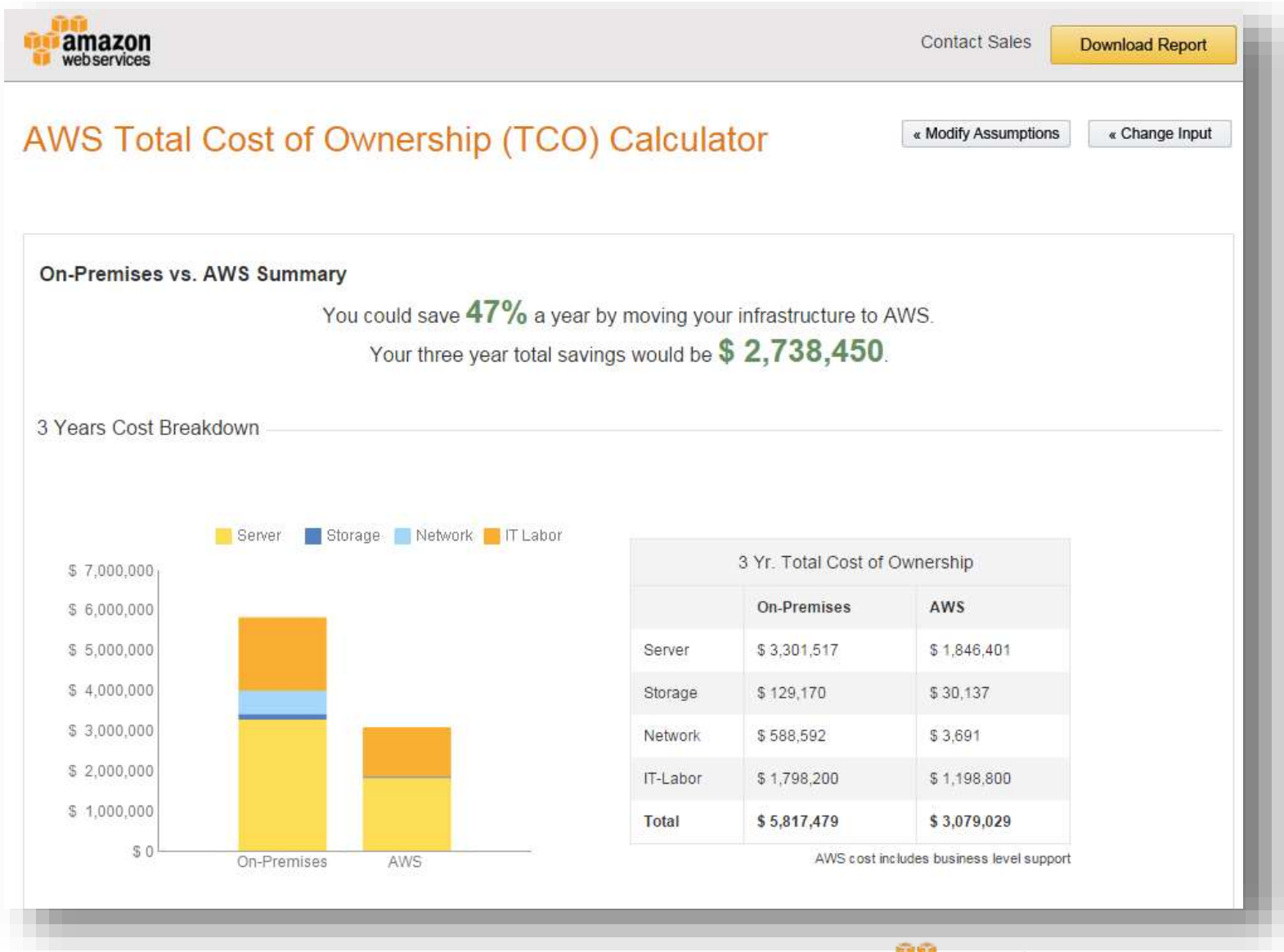
https://awstcocalculator.com

AWS Economics Center

http://aws.amazon.com/economics/

Case studies and research

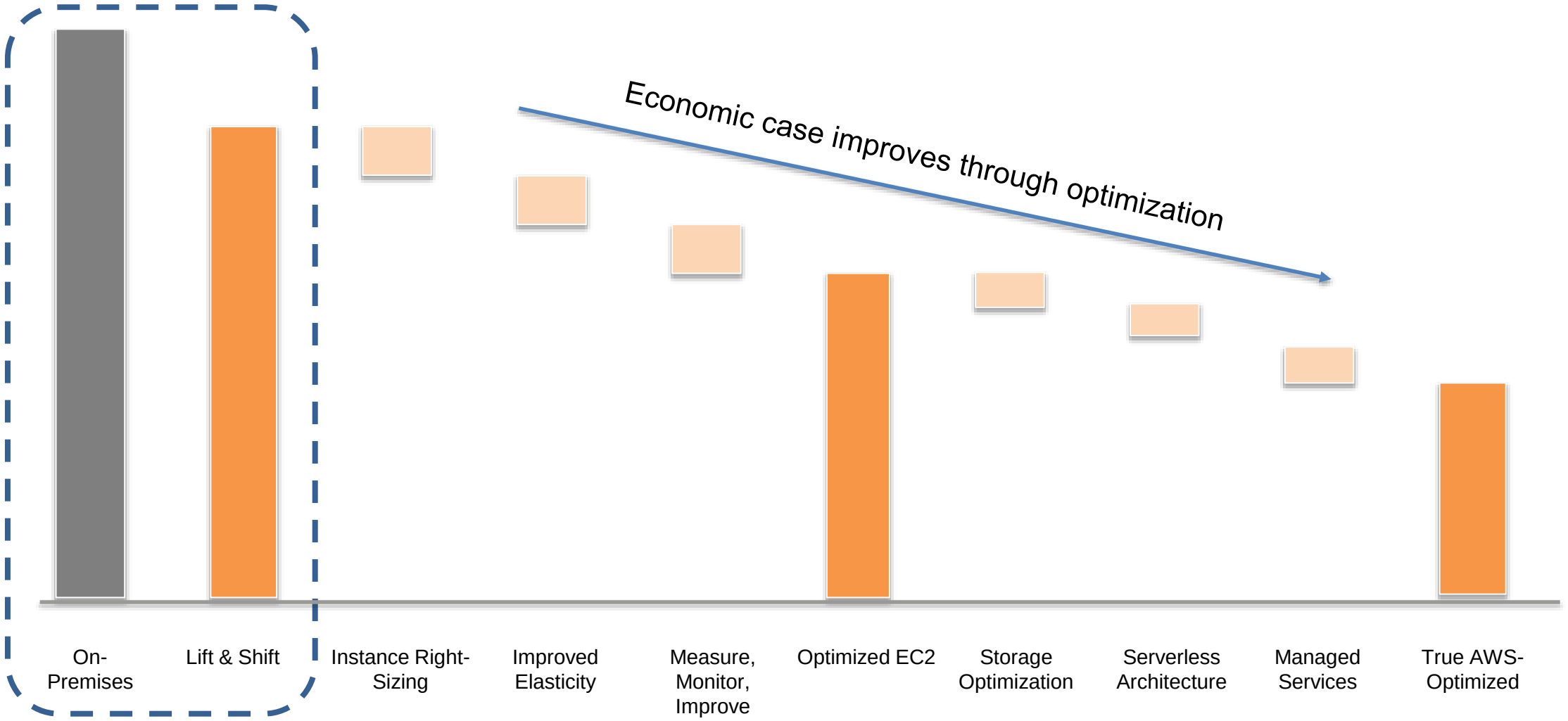
http://aws.amazon.com/economics/



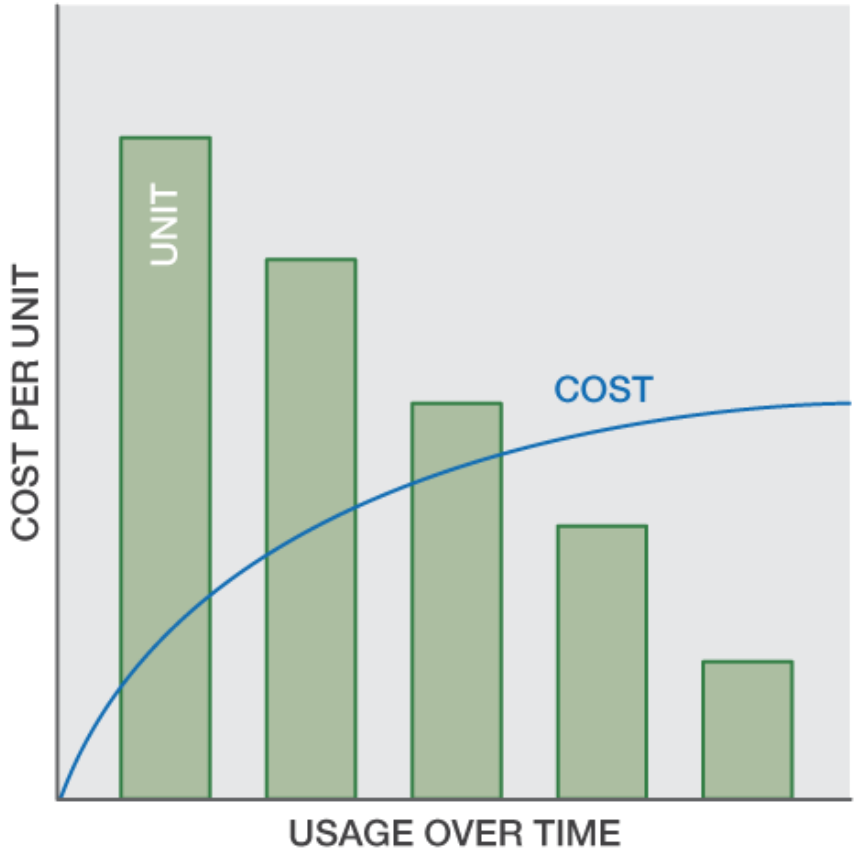
What's in Module 3

- AWS pricing principles
- The simple monthly calculator
- TCO
- Cost optimization

Lowering TCO Through Cost Optimization



What Is Cost Optimization?



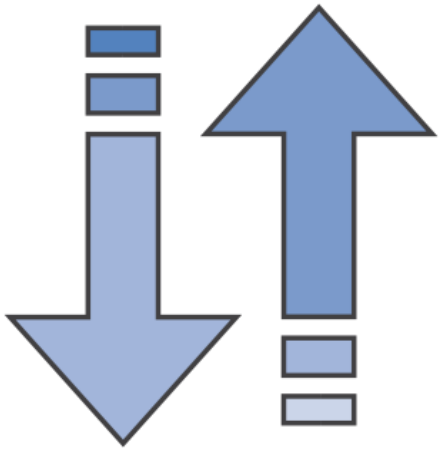
going from…

pay for what you *use*

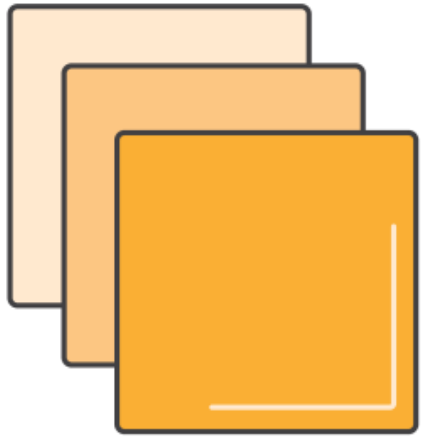
to…

pay for what you *need*

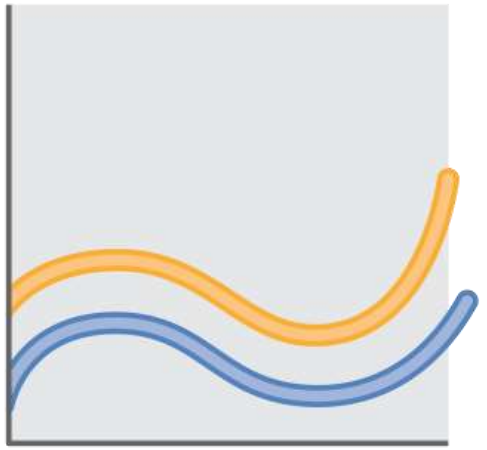
The Four Pillars of Cost Optimization



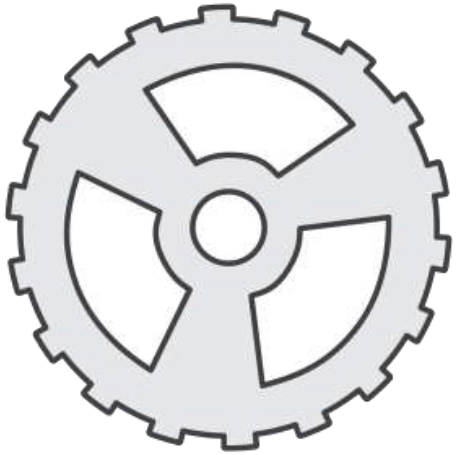
❶ Right-sizing



❷ Reserved Instances

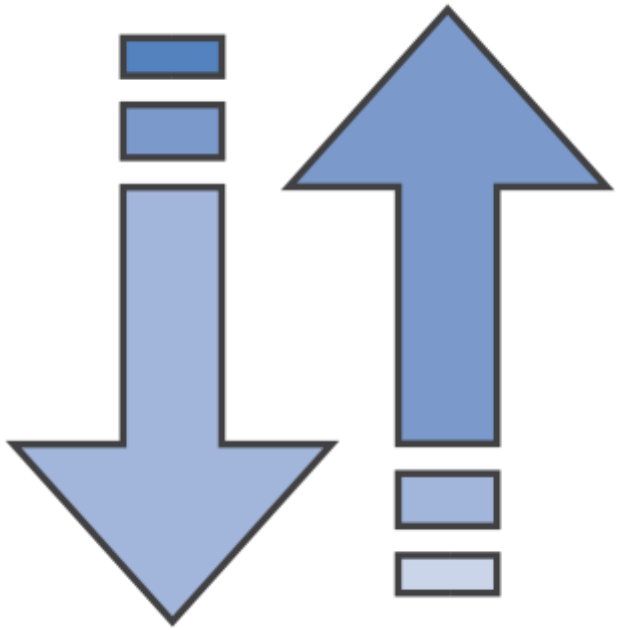


❸ Increase Elasticity



❹ Measure, monitor, and improve

❶ Right-Sizing



- Select the appropriate instance
- Downsize instances
- Leverage Amazon CloudWatch metrics

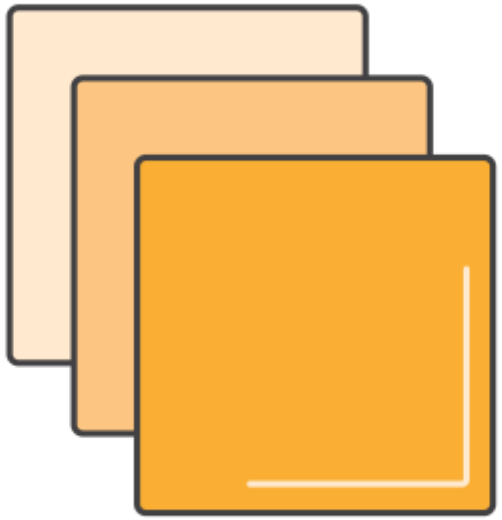
❷ Reserved Instances/Capacity

Up to 75%+ savings

* Dependent on specific AWS service, size/type, and region

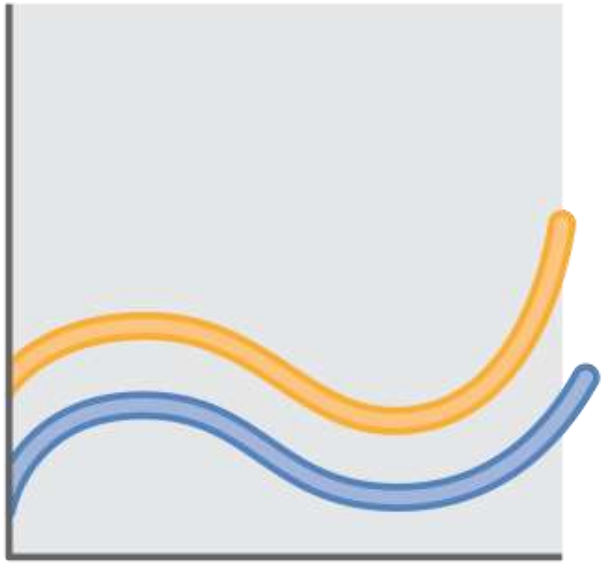
- Reserved Instances/Capacity
  - Amazon EC2
  - Amazon RDS
  - Amazon DynamoDB
  - Amazon Redshift
  - Amazon ElastiCache
- Commitment level
  - 1 year
  - 3 years

❷ Reserved Instances



- Step 1: RI Coverage
  - Cover always-on resources.
  - Target 70–80% always-on coverage.
- Step 2: RI Utilization
  - Leverage RI flexibility to increase utilization.
  - Merge and split RIs as needed.
  - Target 95% RI utilization rate.

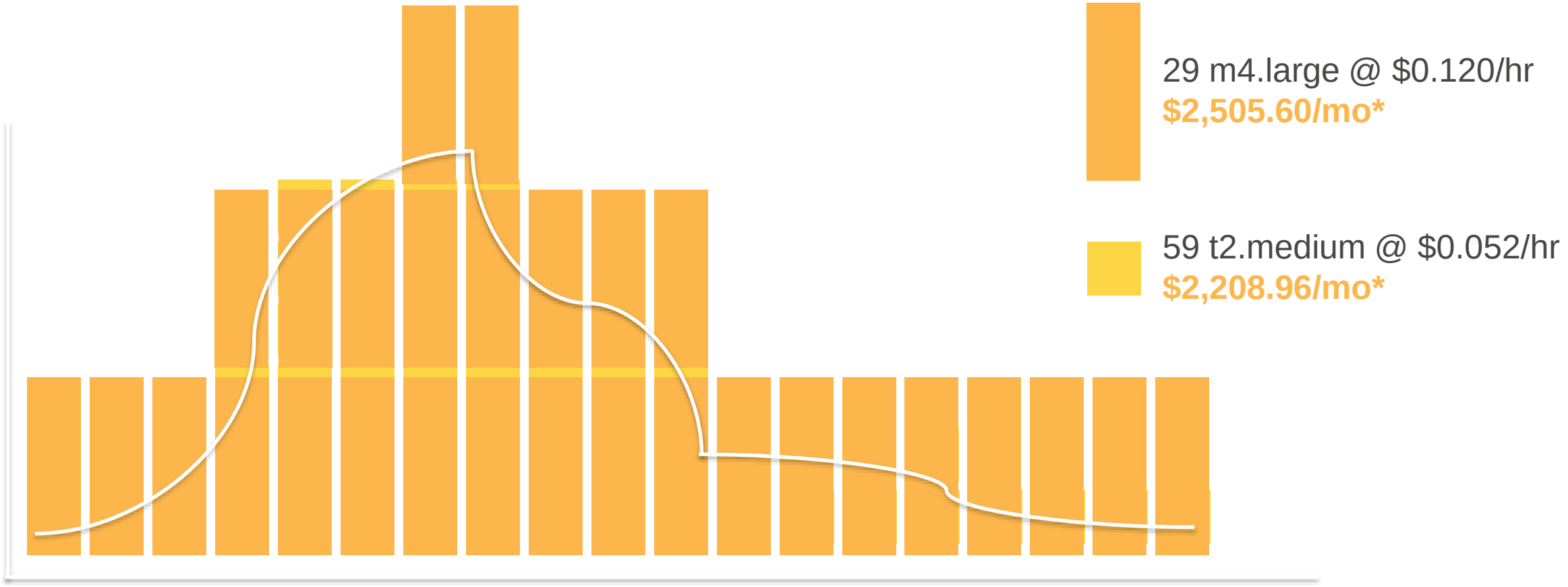
❸ Increase Elasticity



- Turn off nonproduction instances
  - Dev/test, nonproduction instances.
- Autoscale production
  - Use Auto Scaling to scale up and down based on demand and usage (eg, spikes).

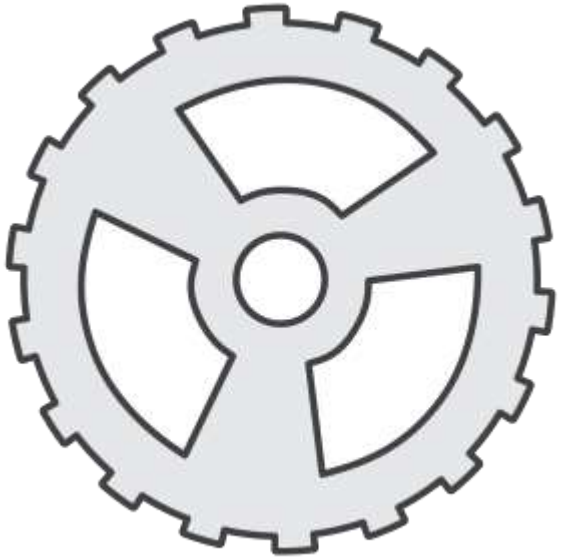
Using Right-sizing and Elasticity to Lower Cost

More, smaller instances vs. fewer, larger instances



*Assumes Linux instances in the US-East (N. Virginia) Region at 720 hours per month

❹ Measure, Monitor, and Improve



Cost Optimization Opportunities

1. Auto-tag resources.
2. Identify always-on nonprod.
3. Identify instances to downsize.
4. Recommend RIs to purchase.
5. Dashboard your status.
6. Report on savings.

❹ Measure, Monitor, and Improve – Tools

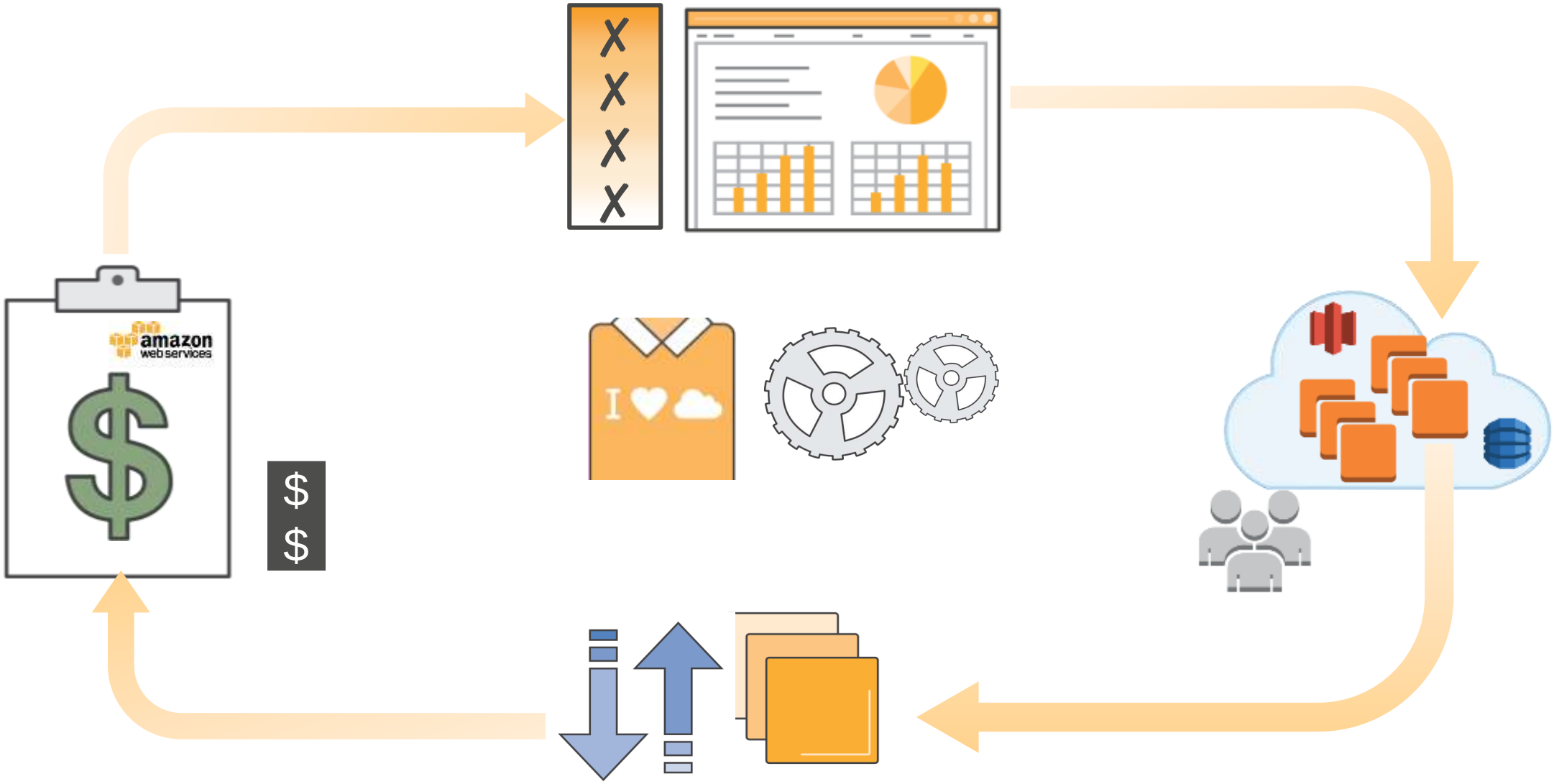
AWS Trusted Advisor

- Optimize your AWS environment.
- Reduce cost, increase performance, and improve security.

Cost Explorer

- View graphs of your costs: the last 13 months.
- Forecast your likely costs: the next 3 months.
- View time data by day or month.

Cycle of Cost Optimization



Key Takeaways

- What are the different purchase options of EC2 instances?
  - On-Demand
  - Reserved instances
  - Spot instances

AWS Business Essentials

Module 1: Getting Started with the Cloud

Module 2: Leveraging AWS for Competitive Advantages

Module 3: Cloud Economics

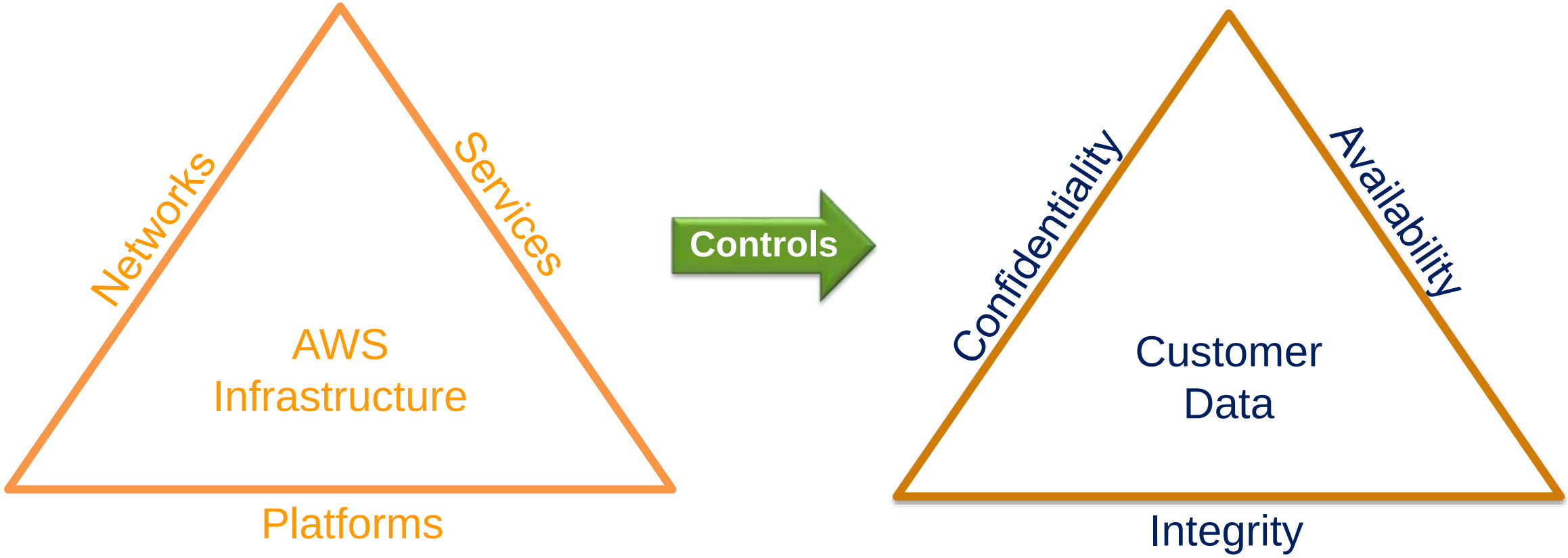
Module 4: Security and Compliance

Module 5: Migrating to the Cloud

What's in Module 4

- Overview of cloud security
- Security of the cloud
- Security in the cloud

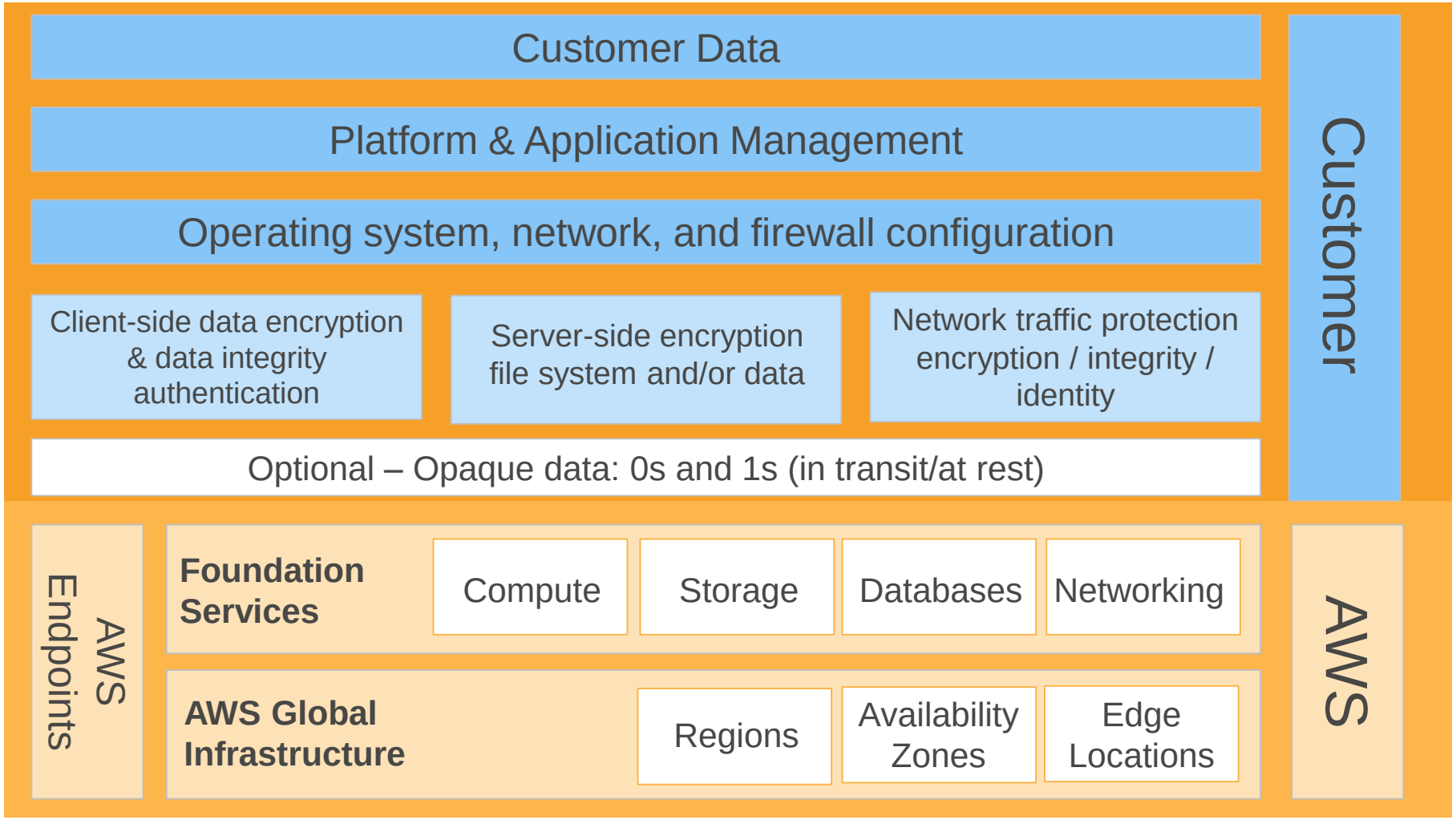
Security Is AWS Top Priority



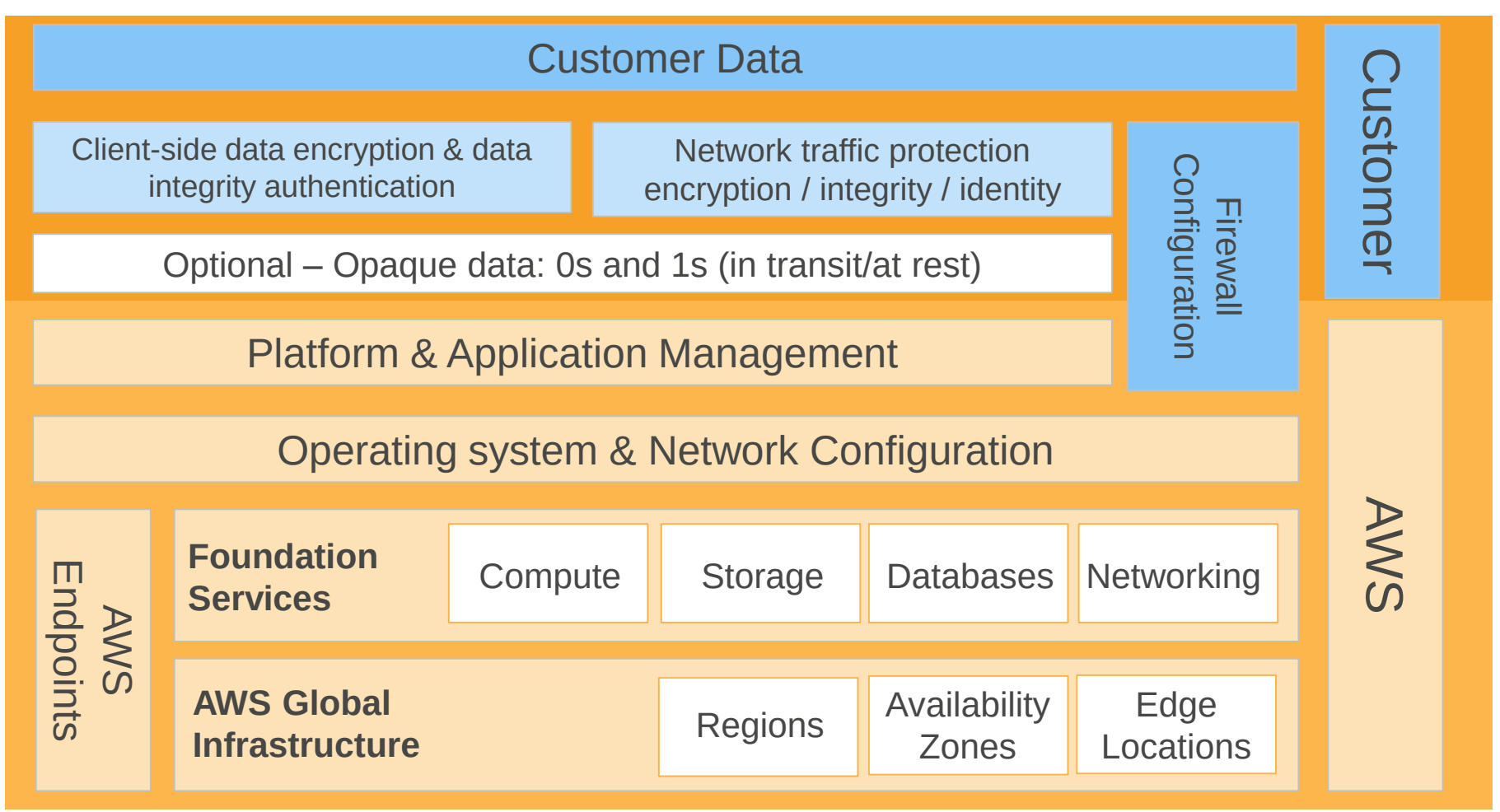
AWS Compliance

- **Maintain** alignment with global requirements.
- **Validate** security control environment.
- **Enable** you to **assess** organization's compliance.
- **Satisfy** your regulators by **automating** compliance tasks.

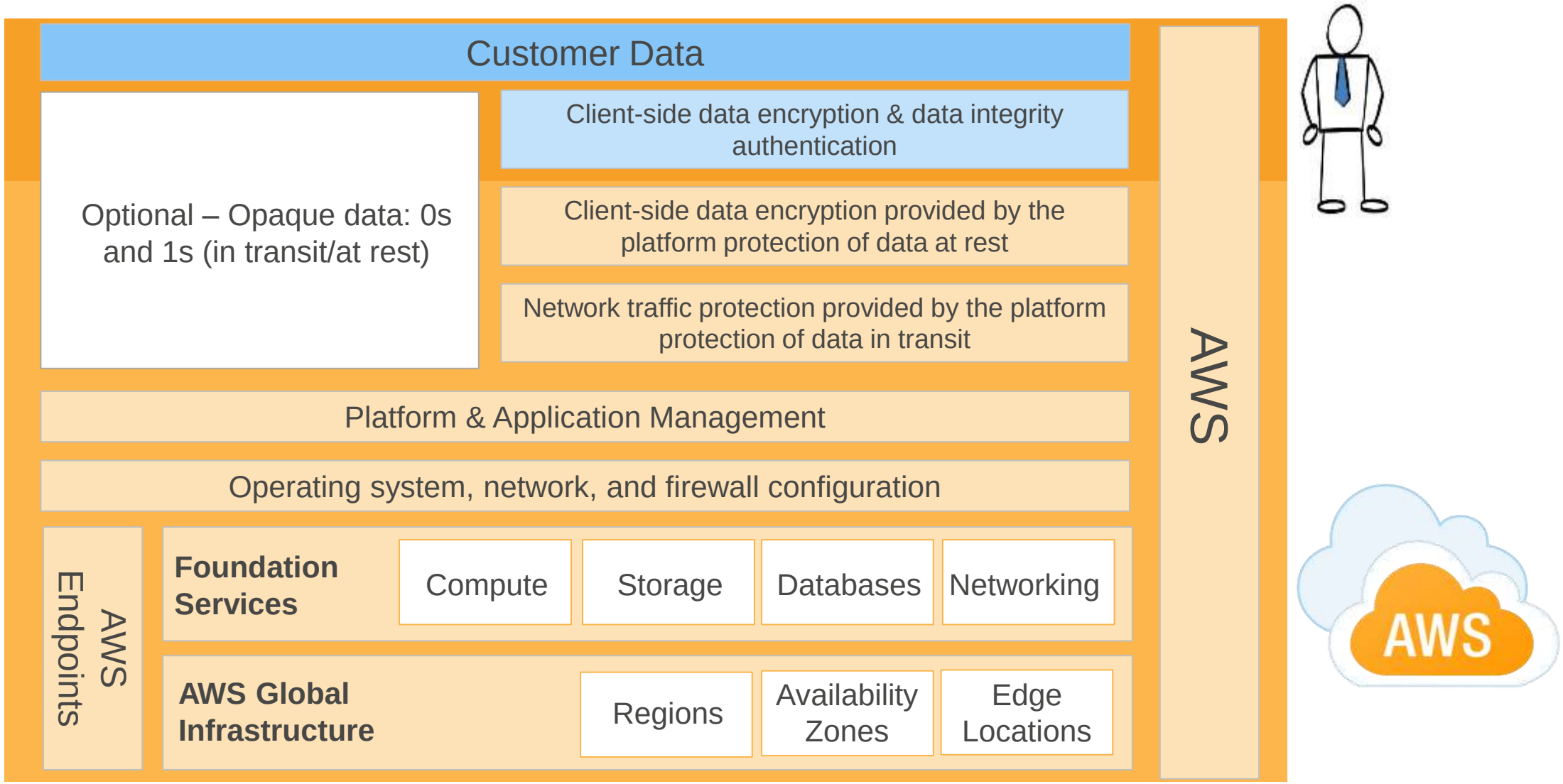
Shared Responsibility Model for Infrastructure Services



Shared Responsibility Model for Managed Services



Shared Responsibility Model for Abstracted Services



What's in Module 4

- Overview of cloud security
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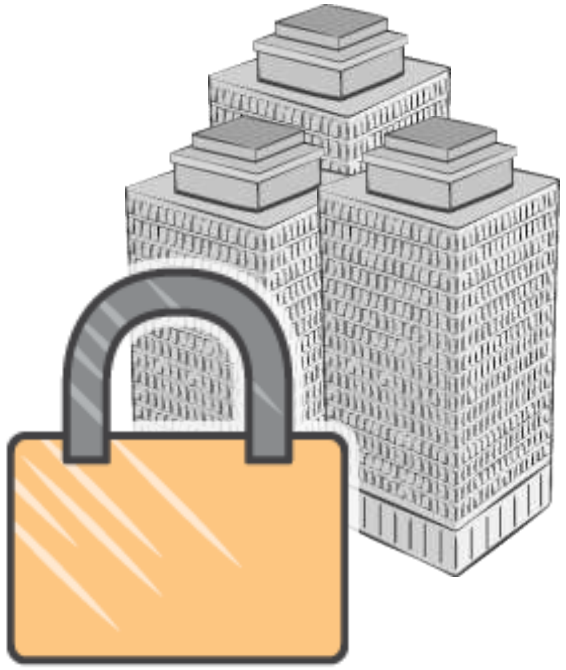
- Security in the cloud

AWS Security Control Framework

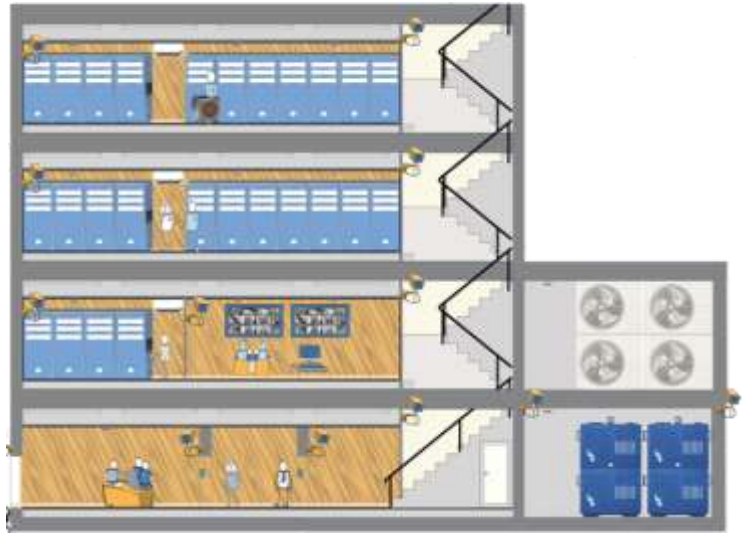
1. Physical and environmental security
2. IT operations
3. Access controls
4. Security policy and governance controls
5. Change management

❶ Physical Security



- Building
- Perimeter and entry
- Security staff and surveillance
- Two-factor authentication
- Escort

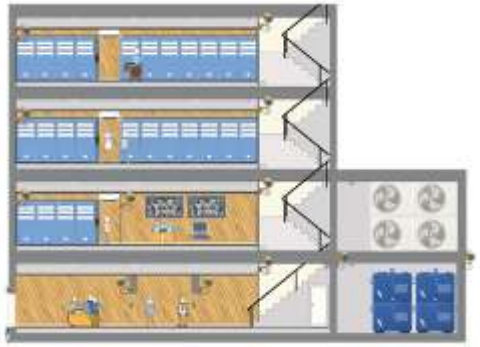
❶ Environmental Security



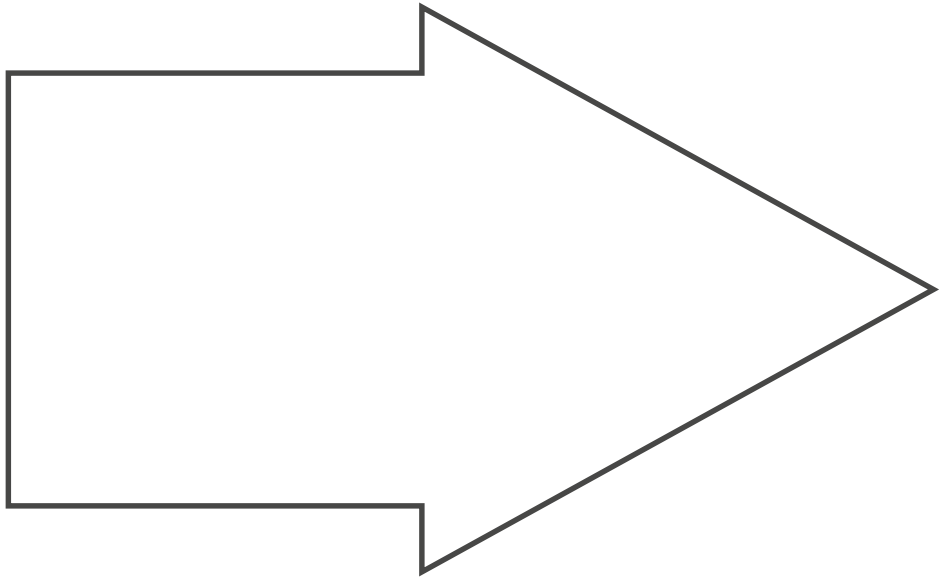
- Fire detection and suppression
- Power
- Climate and temperature
- Monitoring equipment
- Storage device decommissioning

❶ Physical and Environmental Security

Physical Security



Environmental Security



Continuous Audit

❷ IT Operations

Logging

✓ Prevent unauthorized access from being undetected

Vulnerability Management

✓ Third-party penetration testing

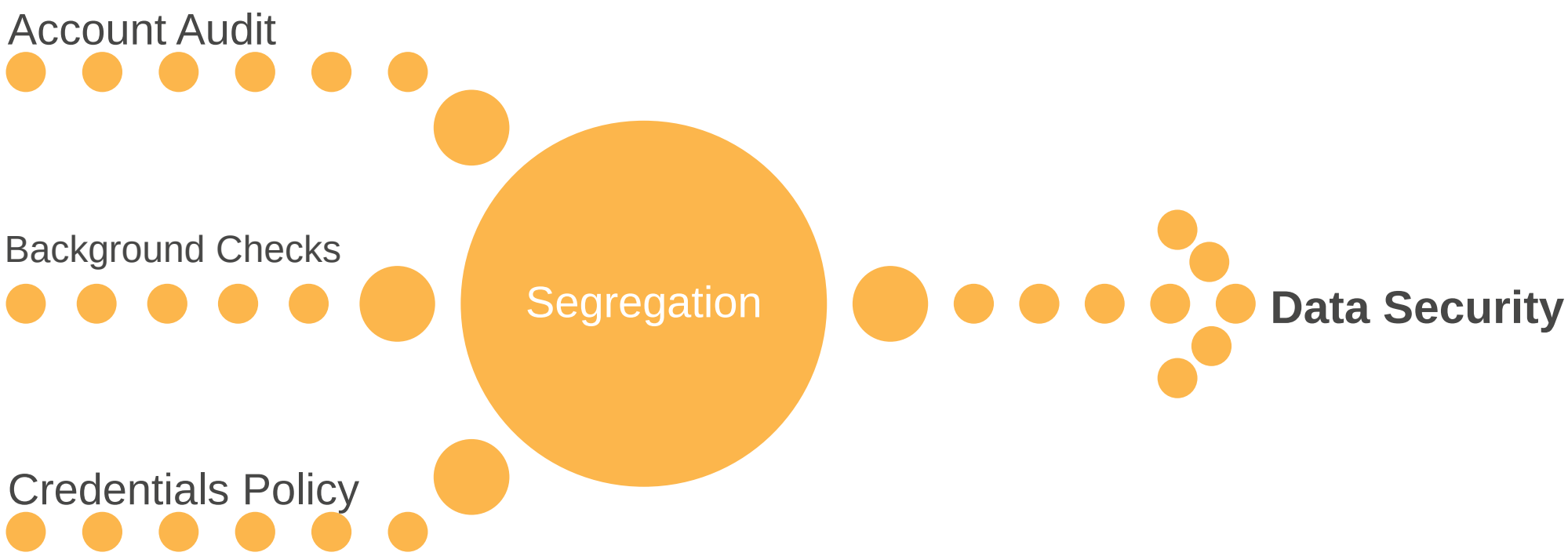
Secure Communication

✓ Prevent sensitive information in transit

Data Management

✓ Detect suspicious activities

❸ Access Controls



❹ Security Policy and Governance Controls

Governance

✓ Guidance for operations and information security

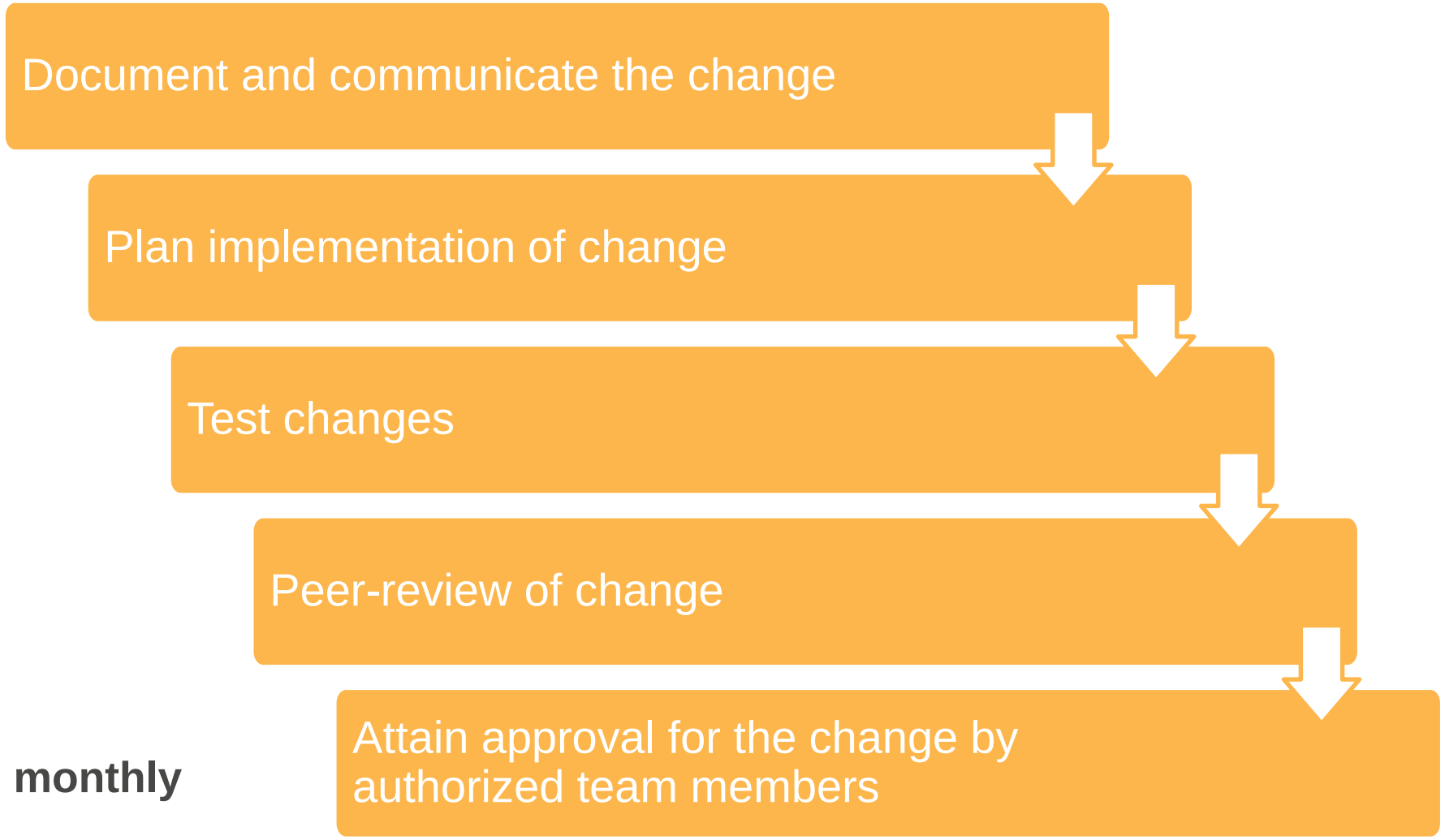
Risk Assessment

✓ Mitigate risks and reduce exposure to vulnerabilities

Compliance

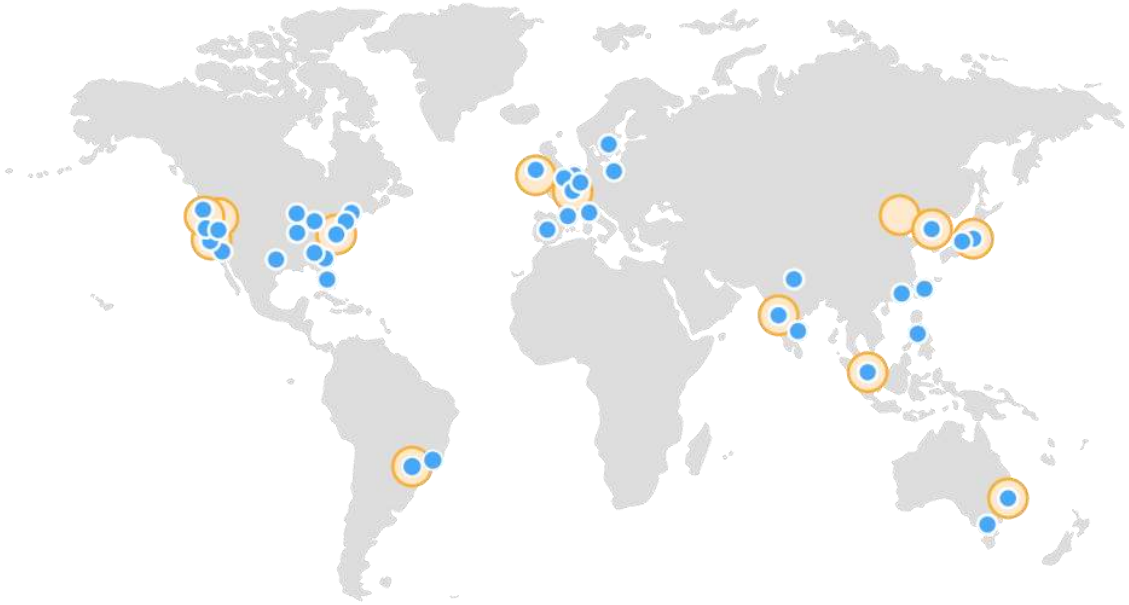
✓ Prevent inadvertent violation of laws & regulations

❺ Change Management Controls



Review all changes monthly

Validated Global Security of the Cloud



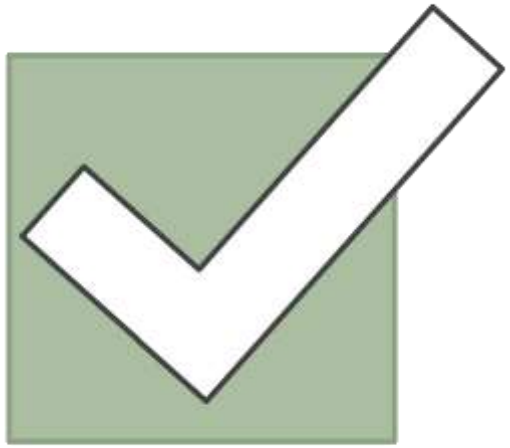
Auditors and standards from **different countries**

Certifications/Attestations

What's in Module 4

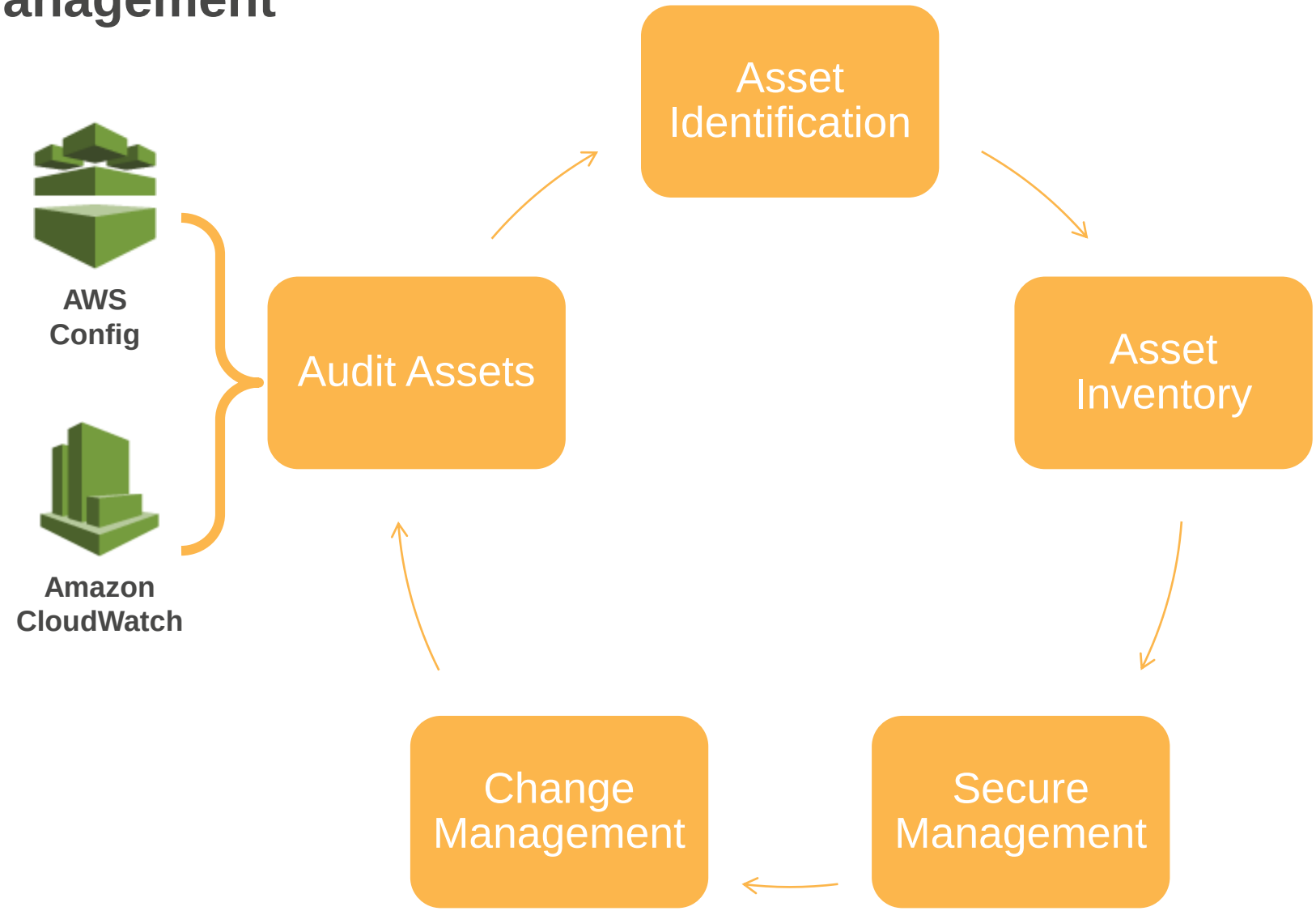
- Overview of cloud security
- Security of the cloud
- Security in the cloud

Security Solutions

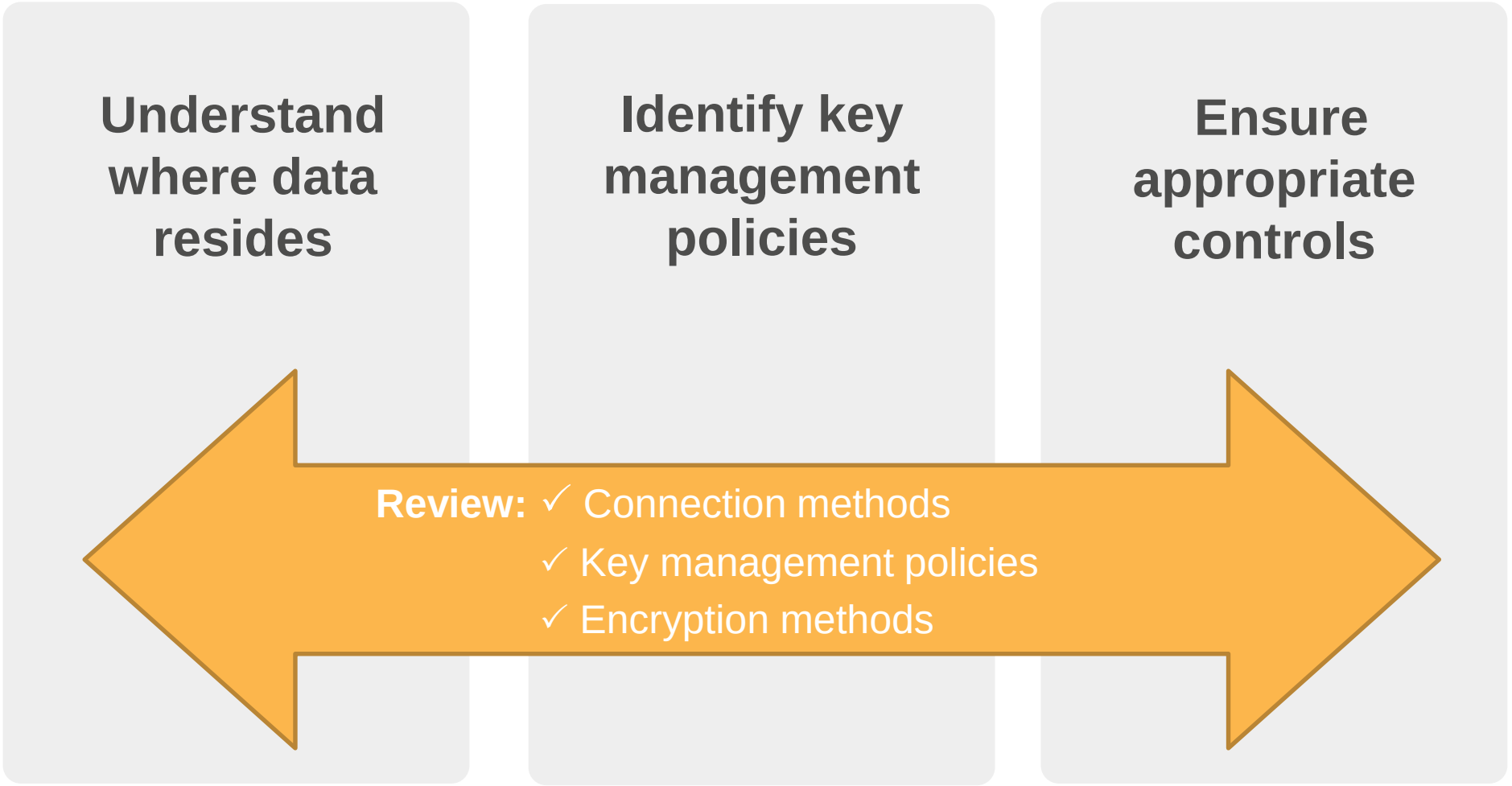


- Asset management
- Data security
- Network security
- Security tools and services
- Access controls
- Automate security operations

Asset Management

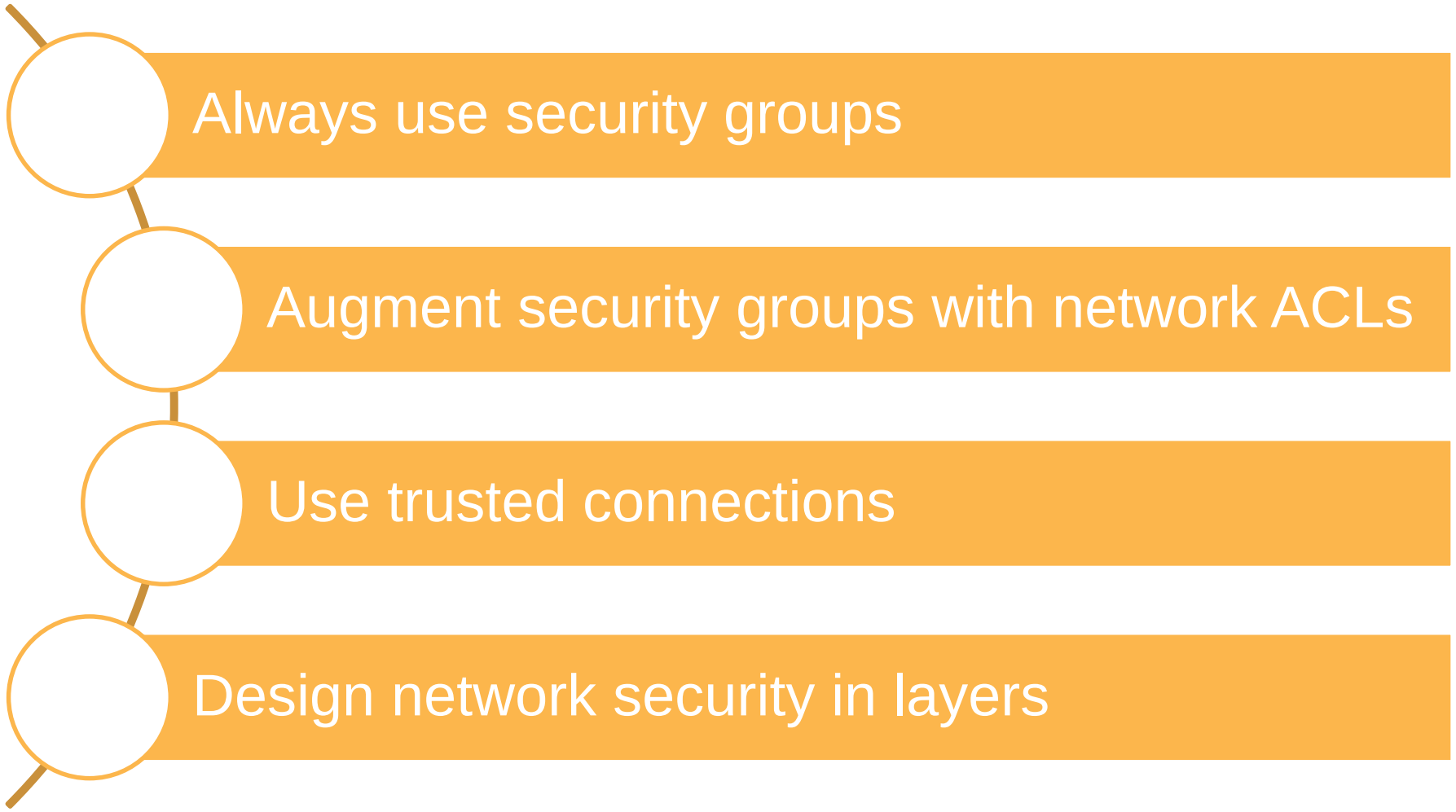


Data Security



Network Security

Best Practices



Security Tools and Services

Networking

Virtual Private Cloud

Web Application Firewall

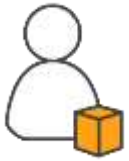
Encryption

Key Management Service (KMS)

CloudHSM

Client-Side Encryption

Identity



Identity Access Management (IAM)

Active Directory Integration

SAML Federation

Compliance

Service Catalog

CloudTrail

Config

Access Controls

- ✓ Grant permissions to individual users/groups
- ✓ Configure a strong password policy for users/groups
- ✓ Enable MFA for privileged users
- ✓ Delegate by using roles instead of by sharing credentials
- ✓ Rotate credentials regularly
- ✓ Monitor activity in your AWS account

Automate Security Operations

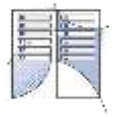
1. Decide what to do (Strategy)

Identify Stakeholders

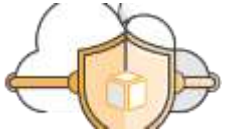
Identify Your Workloads Moving to AWS

2. Analyze and document (outside of AWS)

Rationalize Security Requirements



Define Data Protections and Controls



Document Security Architecture

3. Automate, deploy, and monitor

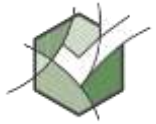
Build/deploy Security Architecture

Automate Security Operations

Continuously Monitor

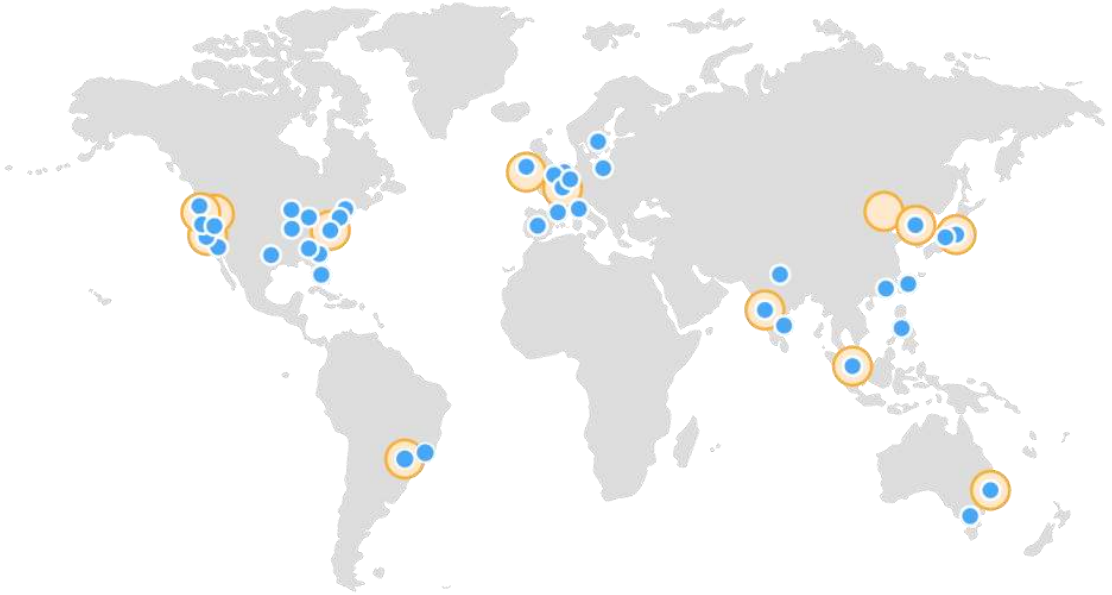
Testing and Game Days

4. Certify



Audit and Certification

Achievable Global Security and Compliance in the Cloud



- Auditors and standards from different countries
- Laws, Regulations, and Privacy
- Alignments/Frameworks

Key Takeaways

- What is “security of the cloud” referring to?
  - Security measures that AWS implements and operates
  - Physical and Environmental Security of AWS data centers
  - IT operations and access controls
  - Security policy and governance controls
  - Change management
  - AWS certifications and attestations
- What is “security in the cloud” referring to?
  - Security measures that the customer implements and operates
  - Achieving data and network security by leveraging AWS security tools and services
  - Enforcing access controls on AWS
  - Automating security operation and governance

AWS Business Essentials

Module 1: Getting Started with the Cloud

Module 2: Leveraging AWS for Competitive Advantages

Module 3: Cloud Economics

Module 4: Security and Compliance

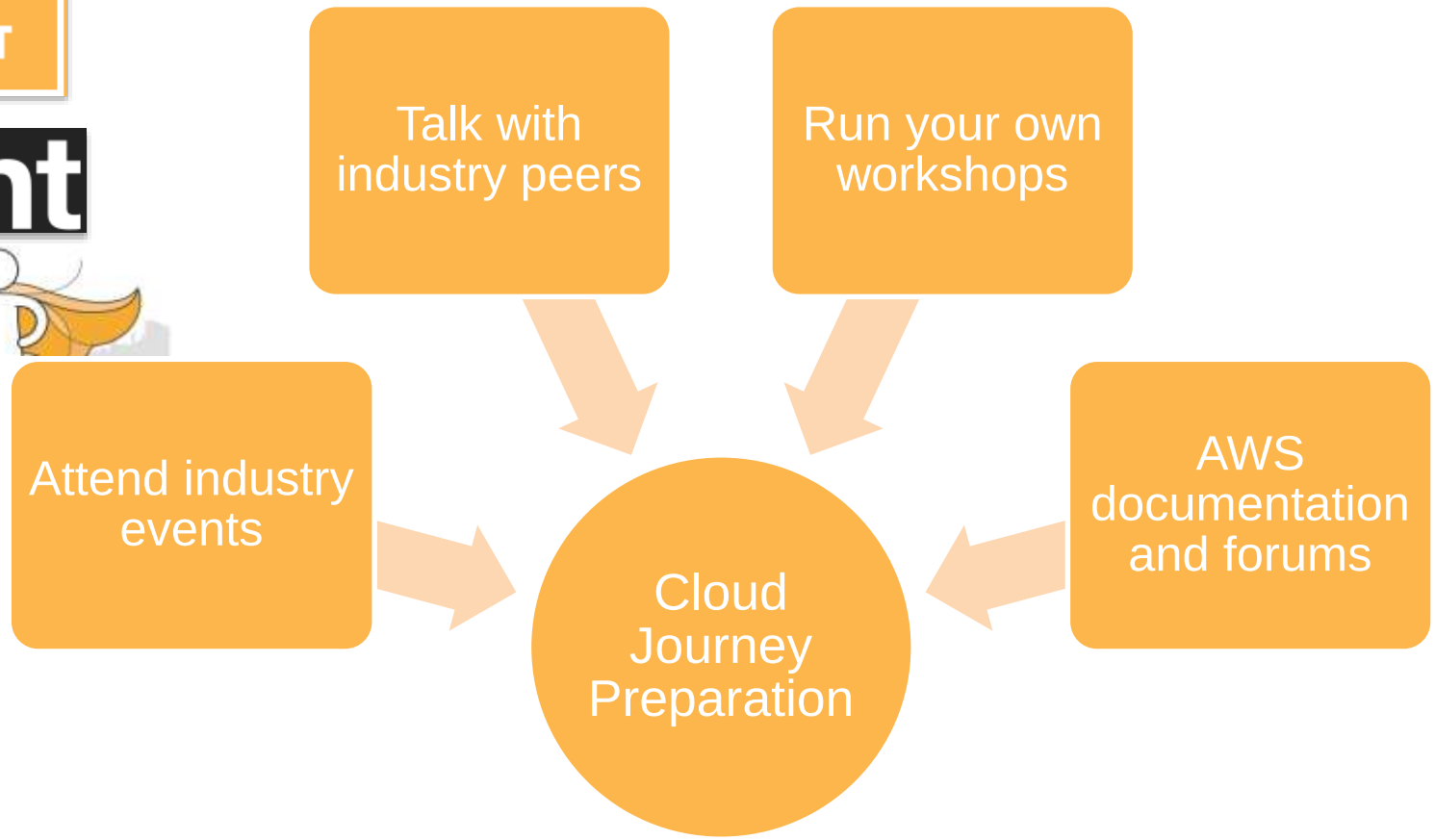
Module 5: Migrating to the Cloud

What's in Module 5

The four steps to cloud success:

- ❶ Explore
- ❷ Experiment
- ❸ Engage
- ❹ Enable

Deeper Dive into the Cloud



AWS Blog

AWS Self-Paced Lab

AWS YouTube Channel

AWS Online Course

What's in Module 5

The four steps to cloud success:

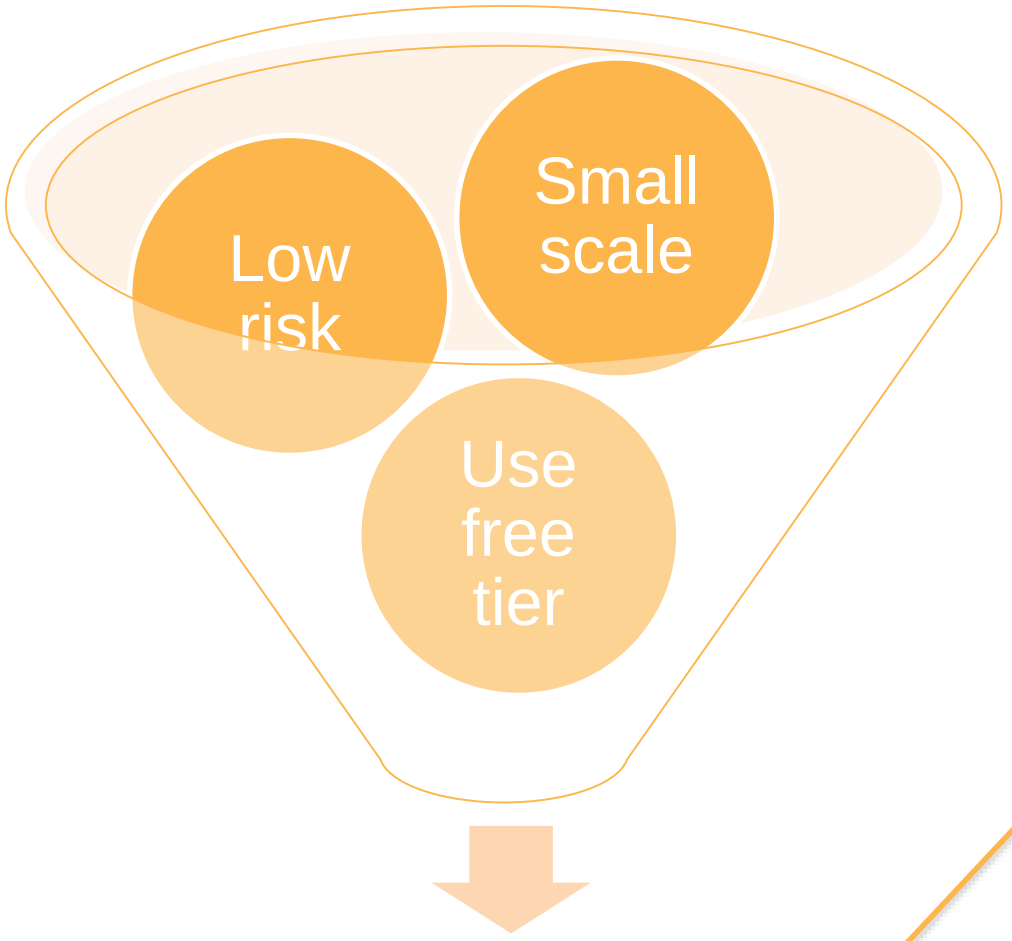
❶ Explore

❷ Experiment

❸ Engage

❹ Enable

Identify Your First Project



Ideal initial projects

- Digital
  - Static website
  - Web/mobile application service
  - Virtual desktop
- Storage
- Backup
- Test and Development

What's in Module 5

The four steps to cloud success:

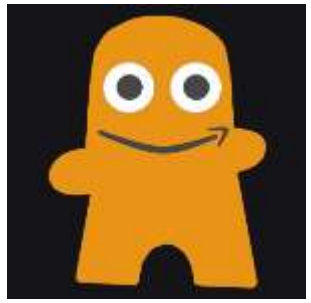
❶ Explore

❷ Experiment

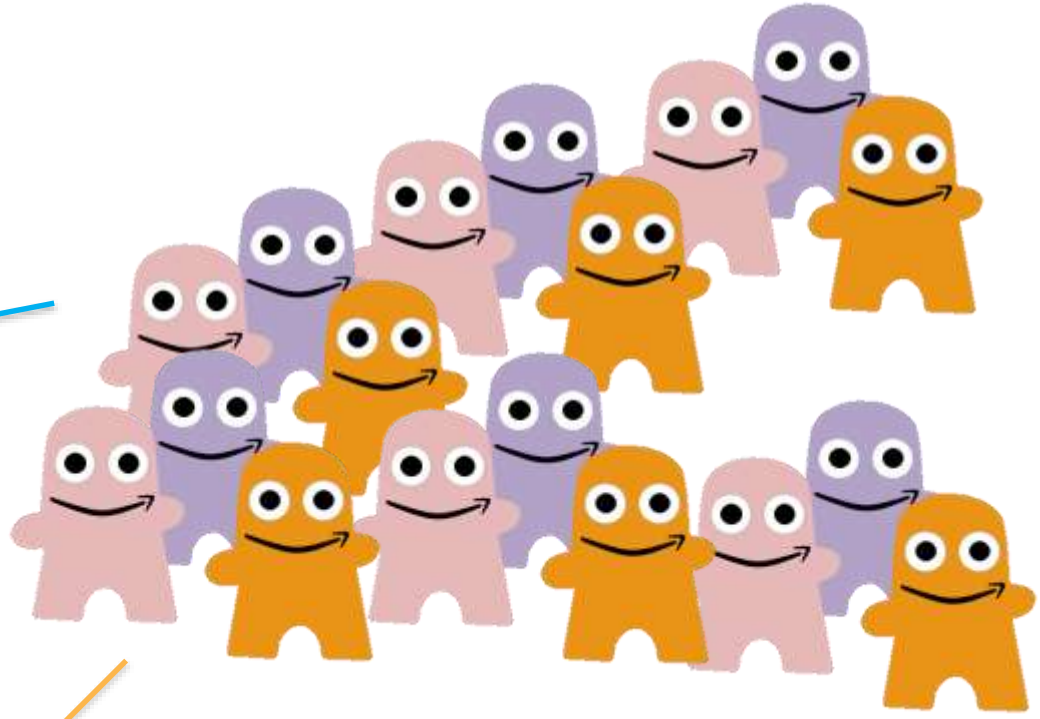
❸ Engage

❹ Enable

AWS Is Here for You!



Account Manager
Solutions Architect



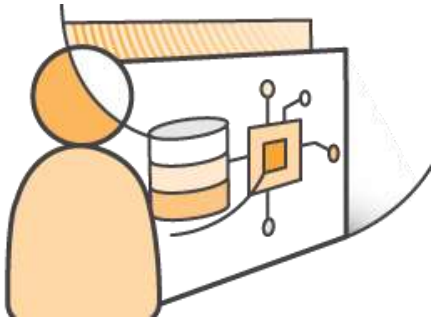
SMEs

Customer Support teams

Pro-Serve Consultant
Technical Account Manager

You

AWS Helps Develop Your Skills

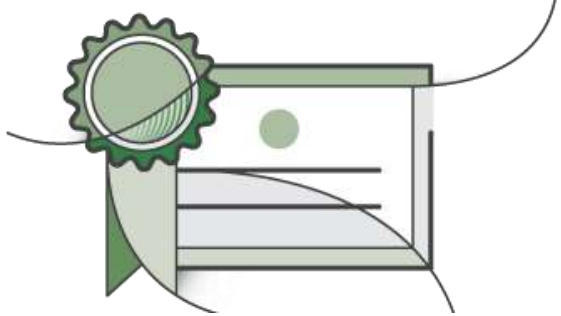


Online
In a classroom

Take a Class

Online
Live AWS services

Practice with a Lab

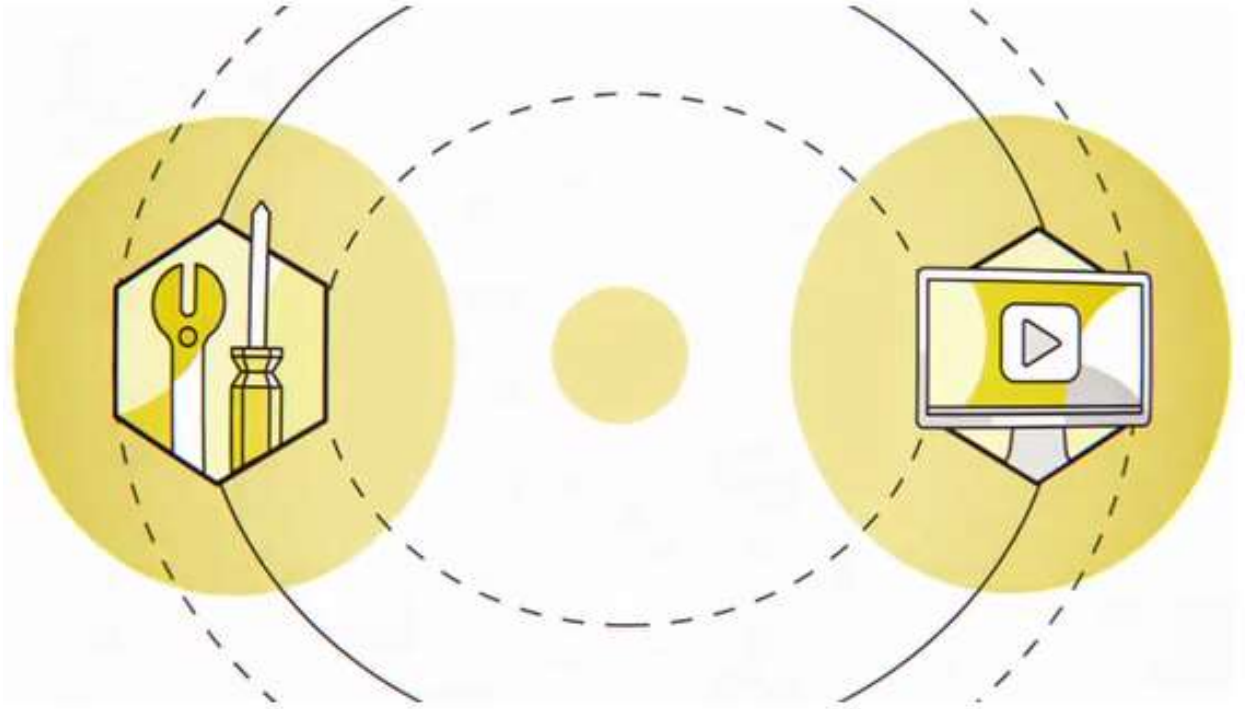


Advance your career
Validate your expertise

Get AWS Certified

AWS Training and Certification

AWS Partner Ecosystem



Consulting Partners

Technology Partners

System Integrators

Specialist Partners

- HPC
- DevOps
- Analytics

Find a suitable partner at http://www.aws-partner-directory.com

AWS Marketplace

35 Categories

2700 Listings

205,000,000 EC2 Instance Hours

What's in Module 5

The four steps to cloud success:

❶ Explore

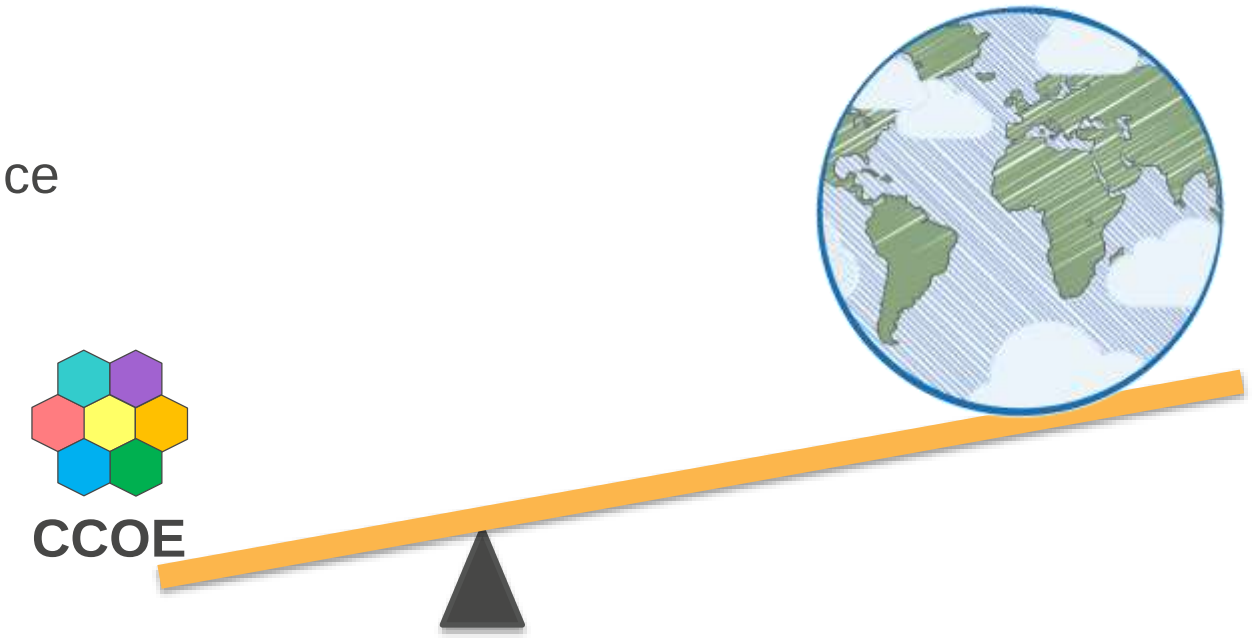
❷ Experiment

❸ Engage

❹ Enable

Create a Cloud Center of Excellence

- Develop a framework
- Act as the interface
- Provide data and cost governance

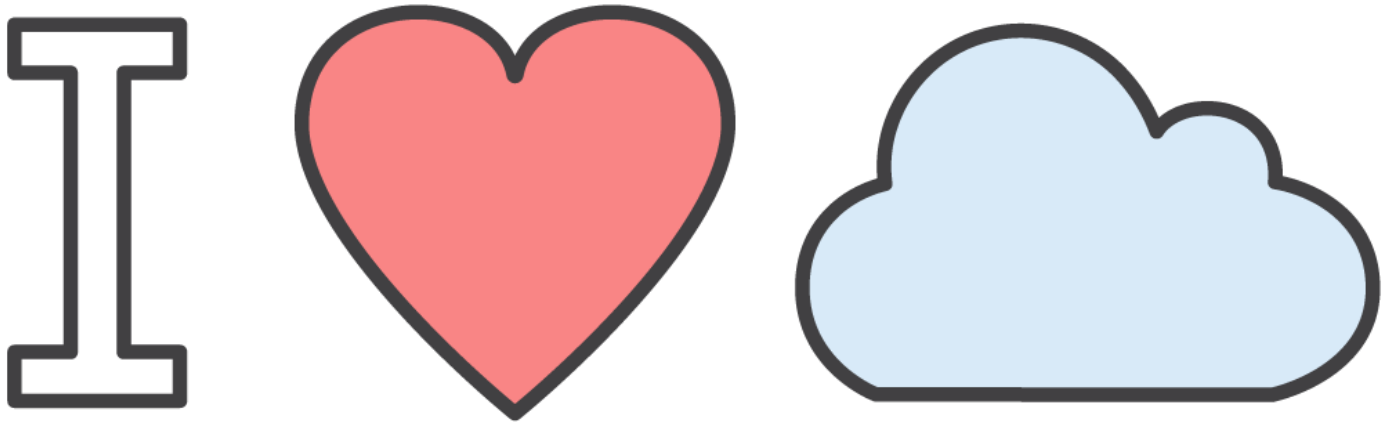


"Give me a lever long enough and a fulcrum on which to place it, and I shall move the world."
-Archimedes

Migration Strategies

Key Takeaways

- How could you get in touch with AWS cloud?
  - Attend industry events; re:Invent, Summit and AWSome Day.
  - Review AWS documentation and forums: AWS Blog, AWS YouTube Channel, AWS Online Course.
  - Run AWS Labs.
  - Develop your Skills through training and certification.
  - Leverage a large team of: Account Manager, SA, TAM, Pro-Serve Consultant and Partners.



Thank You