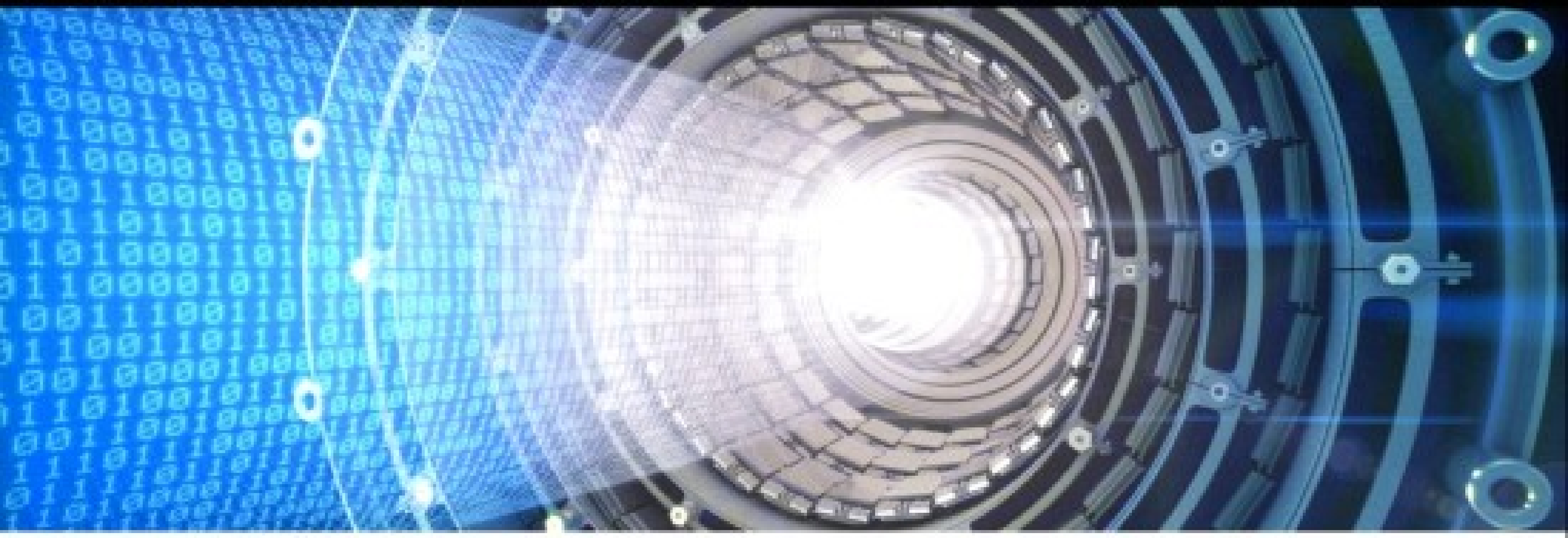


Democratizing Supercomputers:

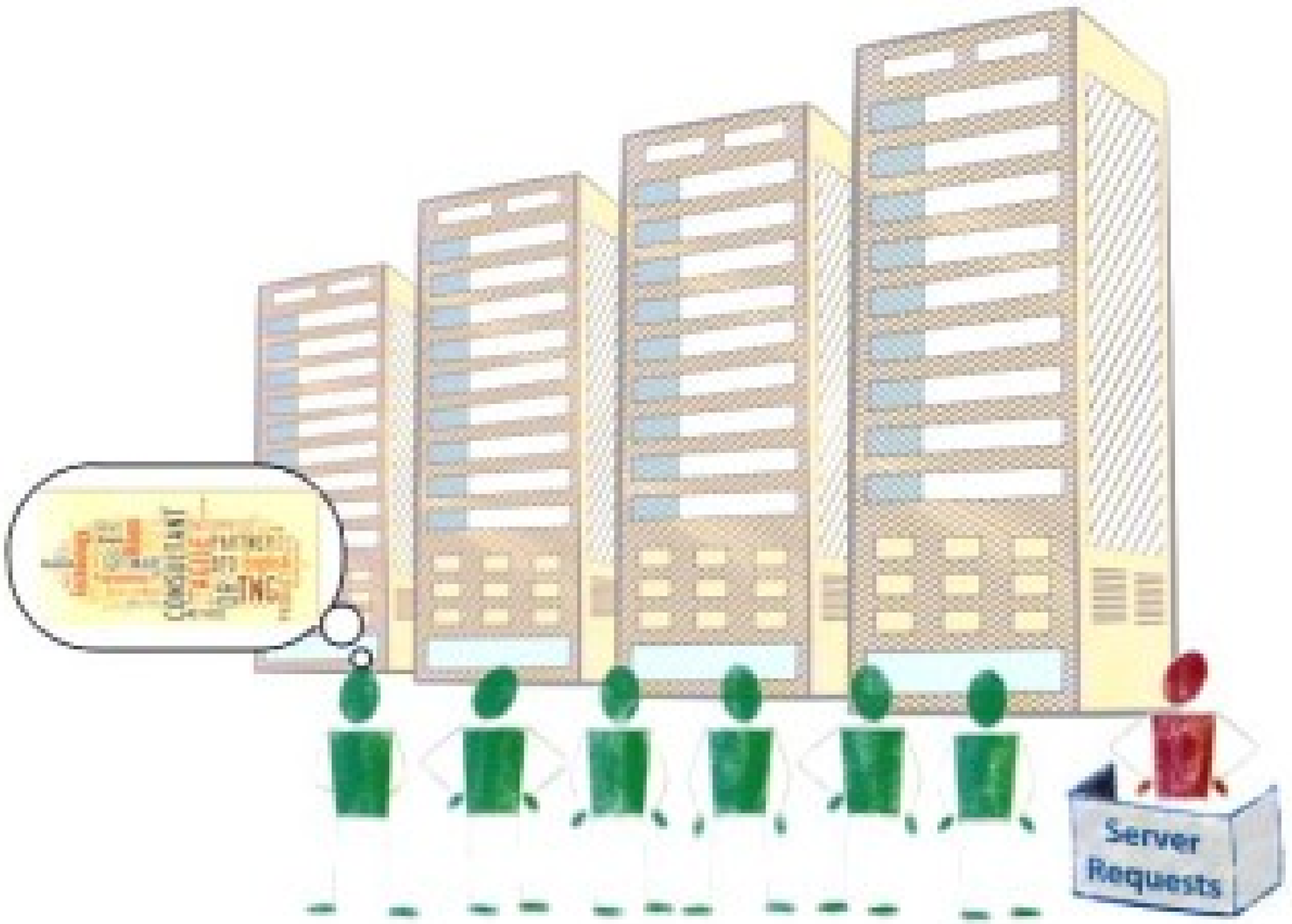
How everybody can wield infinite compute power

Constantin Gonzalez
Solutions Architect AWS
glez@amazon.de

amazon web services

Big Tech is a Wonderful Thing

But Building/Managing IT Infrastructure is Painful



- Procurement requests
- Vendor meetings
- RFI/RFQ
- Purchase Orders
- Take Delivery
- Unpack Hardware
- Connect Hardware
- Install OS
- Install Software
- Monitor/Service/Replace

amazon web services

We Know, Because…

"Amazon is a technology company that happens to sell books online"

– Dr. Werner Vogels, CTO Amazon.com

amazon web services

Amazon Web Services

- Since 2006
- Many data centers in 9 regions + China
- Hundreds of thousands of customers
- 190 countries

amazon web services

Every day, AWS adds enough server capacity to power a whole **$7B** enterprise.

amazon.com

That's about the size **of Amazon.com** in **2004**.

amazon web services

We Think There's a Better Way to Do IT

Add New Dev Environment

Add New Prod Environment

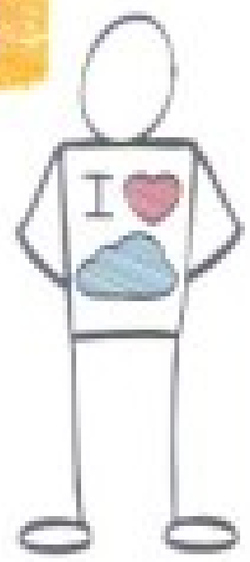
Add New Environment in Japan

Add 1,000 Servers

Remove 1,000 Servers

Deploy 1 PB Data Warehouse

Shut down 1 PB Data Warehouse



... in minutes. World wide. 100% Automated.

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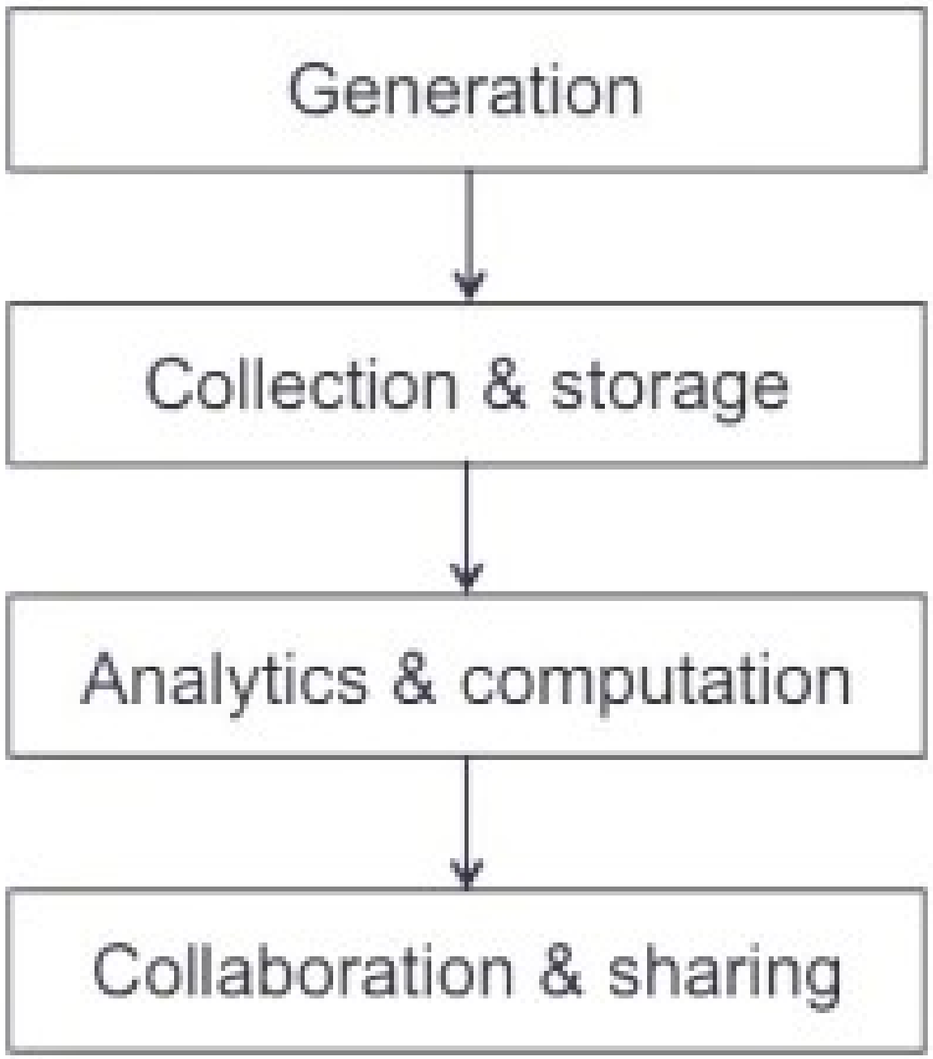
Big Data

Big Data/Analytics Life-Cycle



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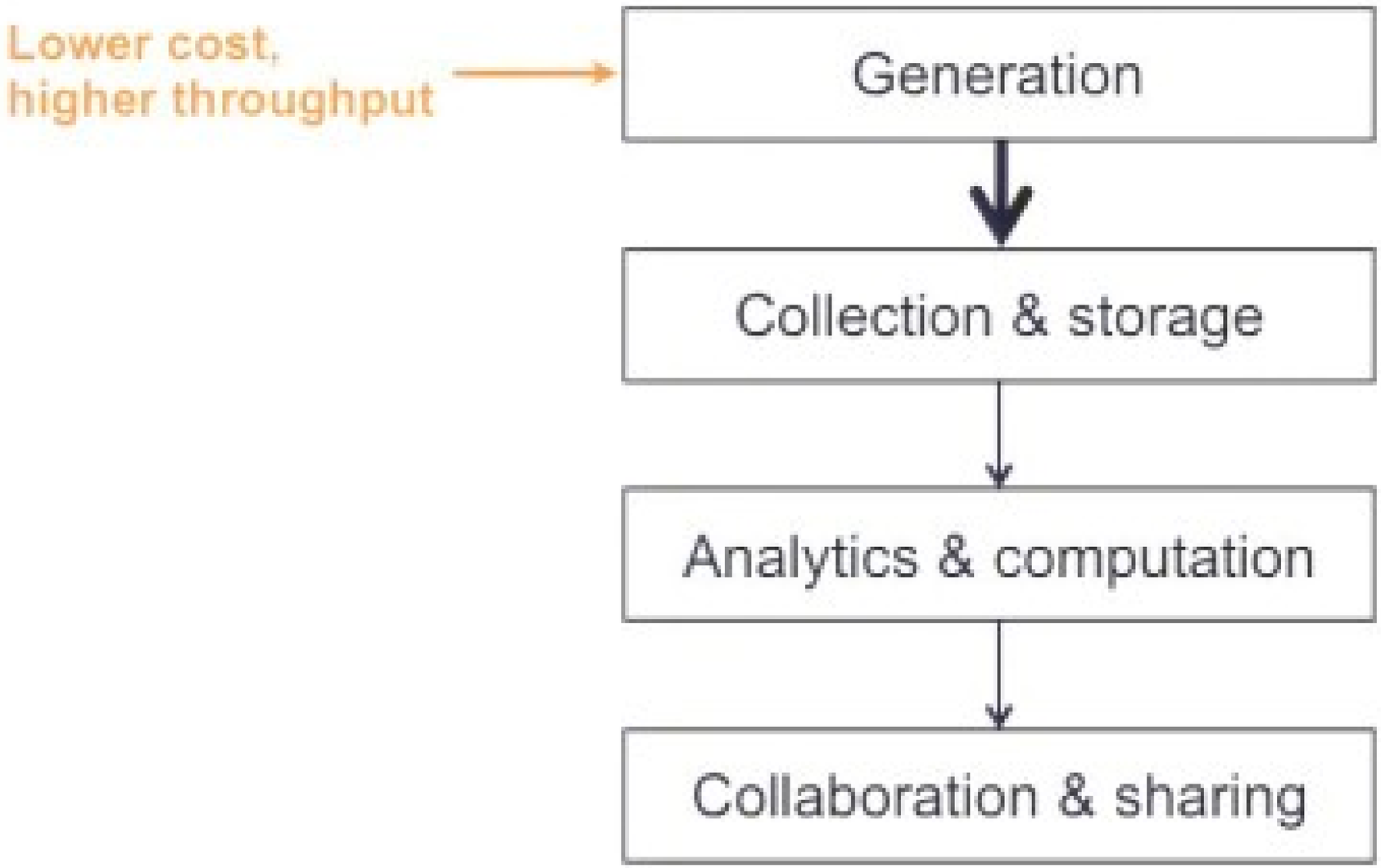
The cost of data generation
is **falling**

amazon
web services

The volume of data
is **increasing**

amazon web services



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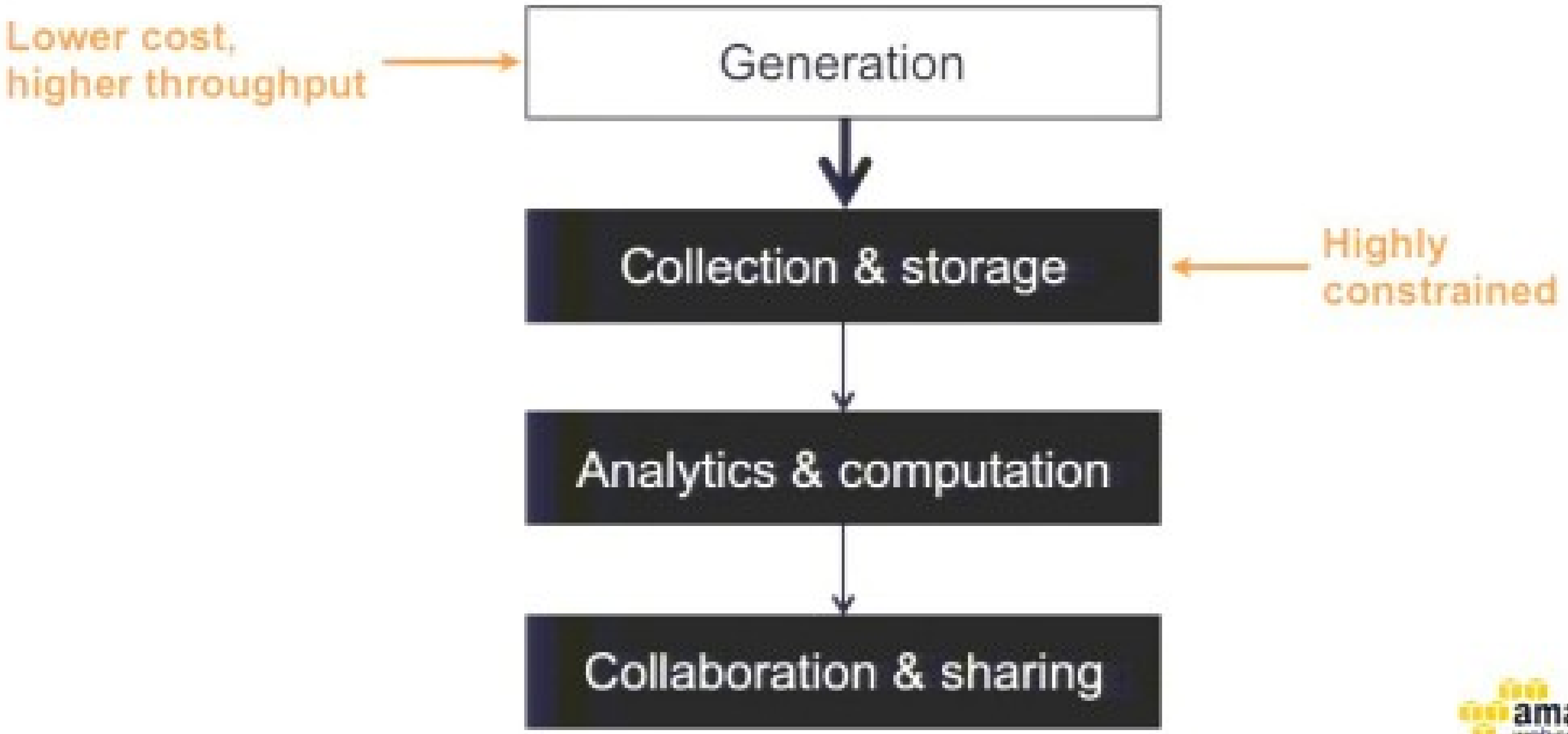

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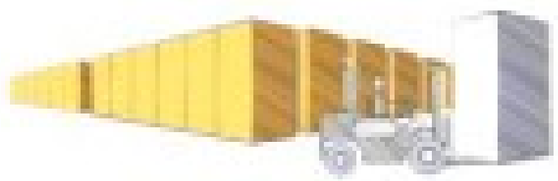
amazon
web services

Cloud Computing

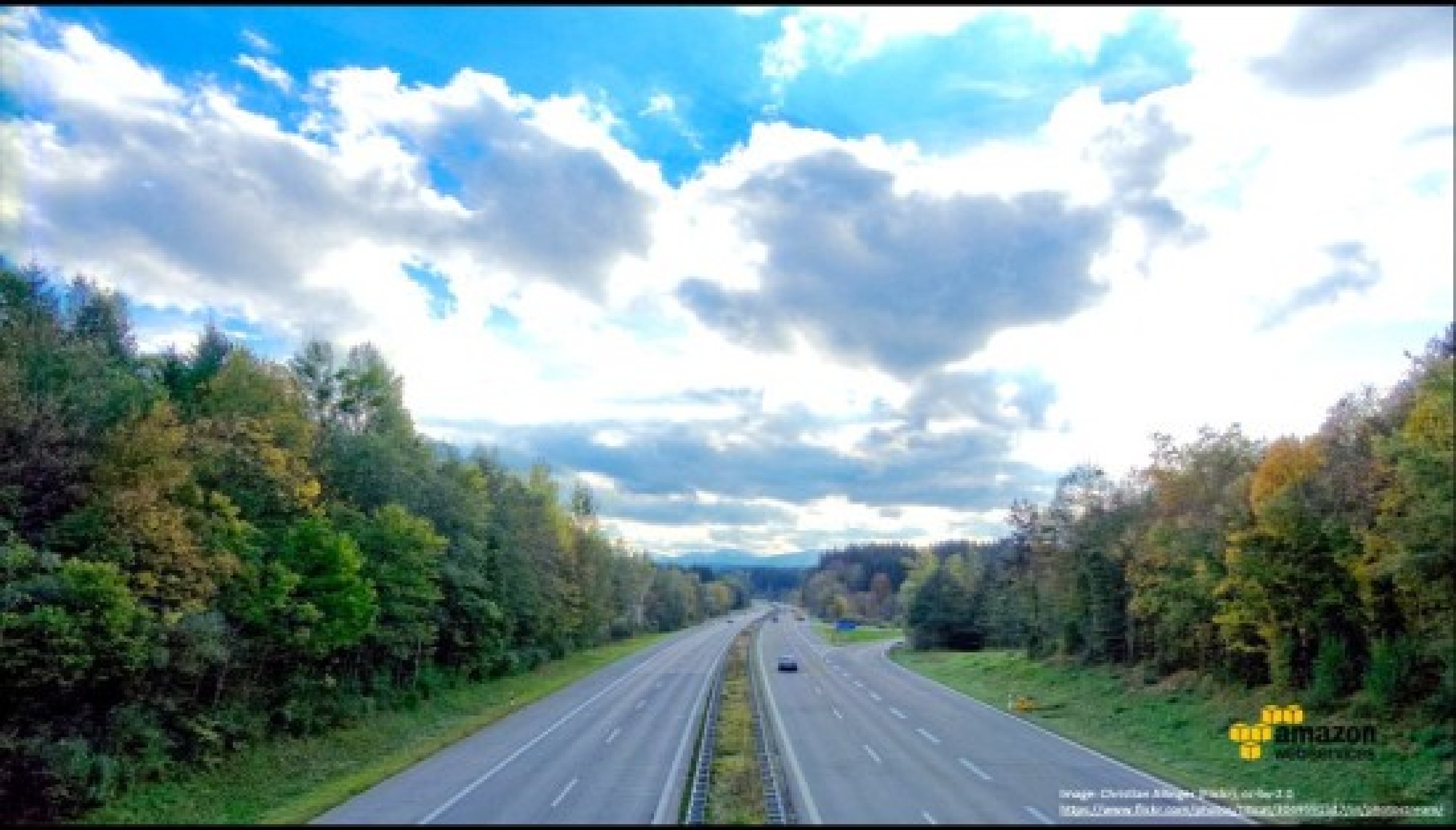
Elastic & Highly Scalable
+
No capital expense
+
Pay-per-use
+
On-demand
+
Globally Available

$0

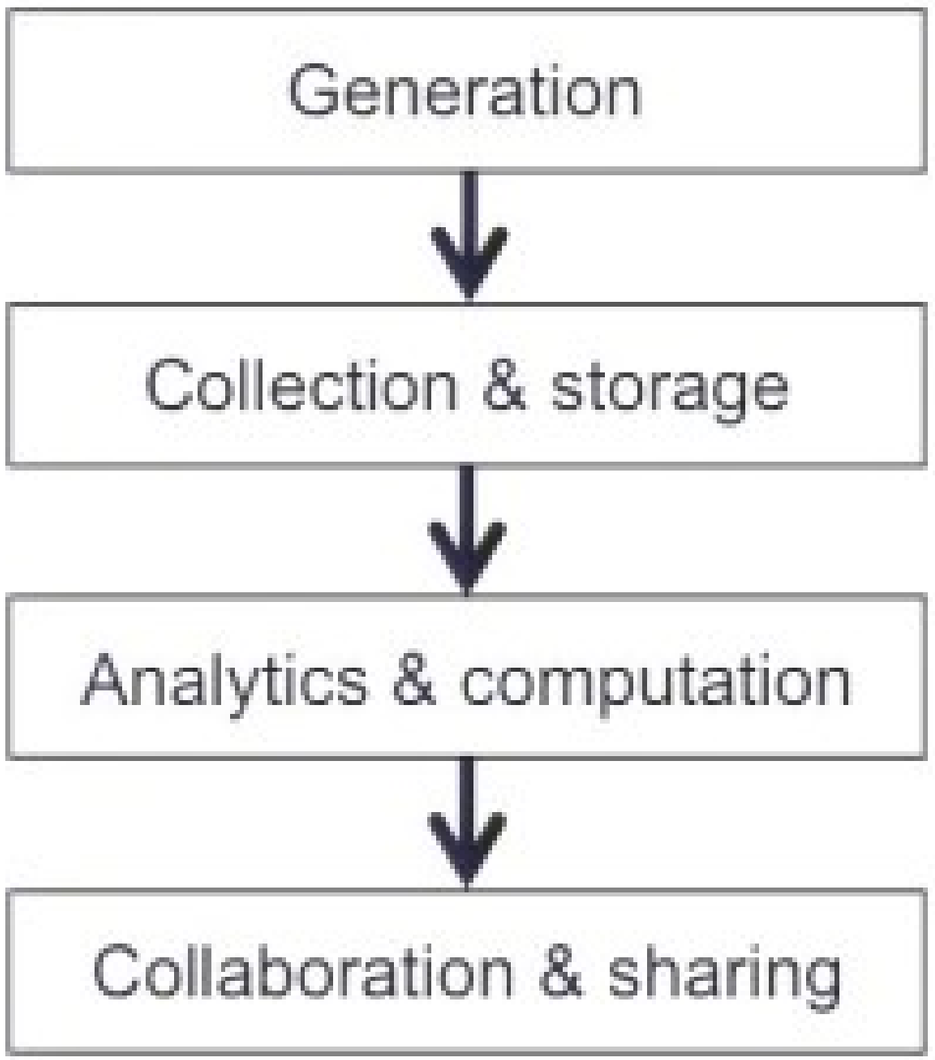


= Remove constraints

amazon web services


amazon
web services

Accelerated



amazon web services

razorfish

“who buys video games?”

amazon web services

Per day:

3.5 billion records
13 TB of click stream logs
71 million unique cookies

amazon web services

Results:

500% return on ad spend

From **2 months** procurement time to a **minute**

amazon web services

How?

Amazon
Simple Storage Service
(S3)

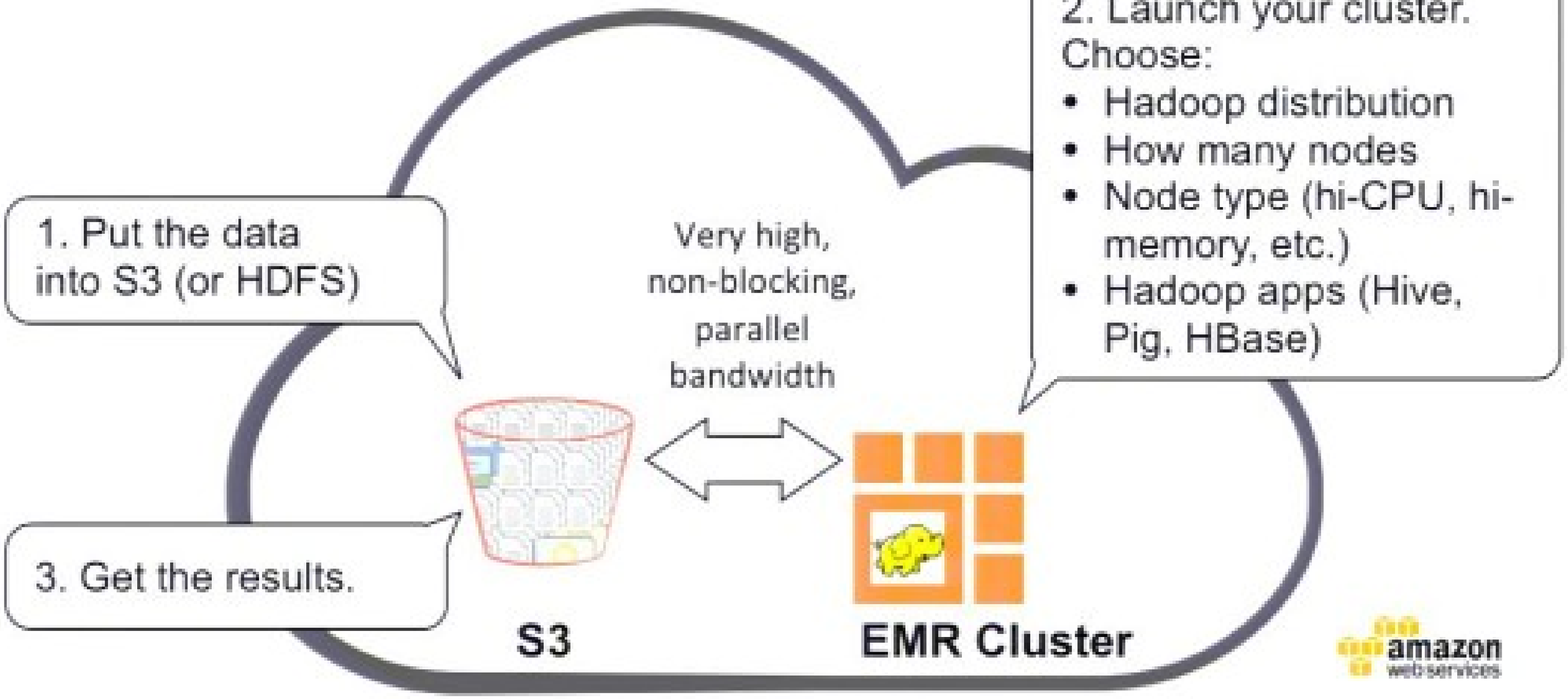
amazon web services

Amazon Simple Storage Service (S3)

- Durability:
  99.999999999%
- Cost:
  $0.03/GB/Month
- Capacity:
  unlimited

amazon web services

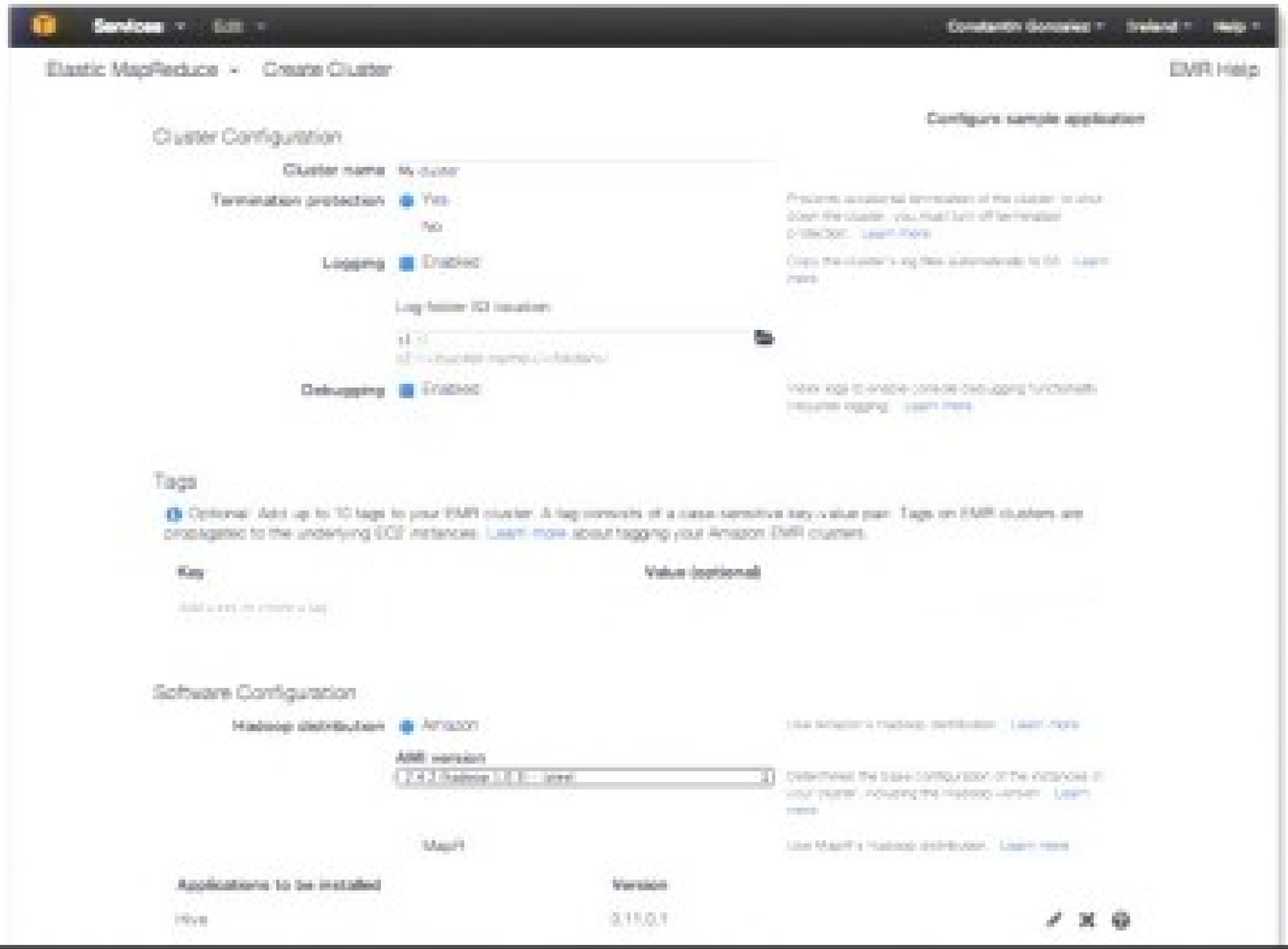
How does ist work?



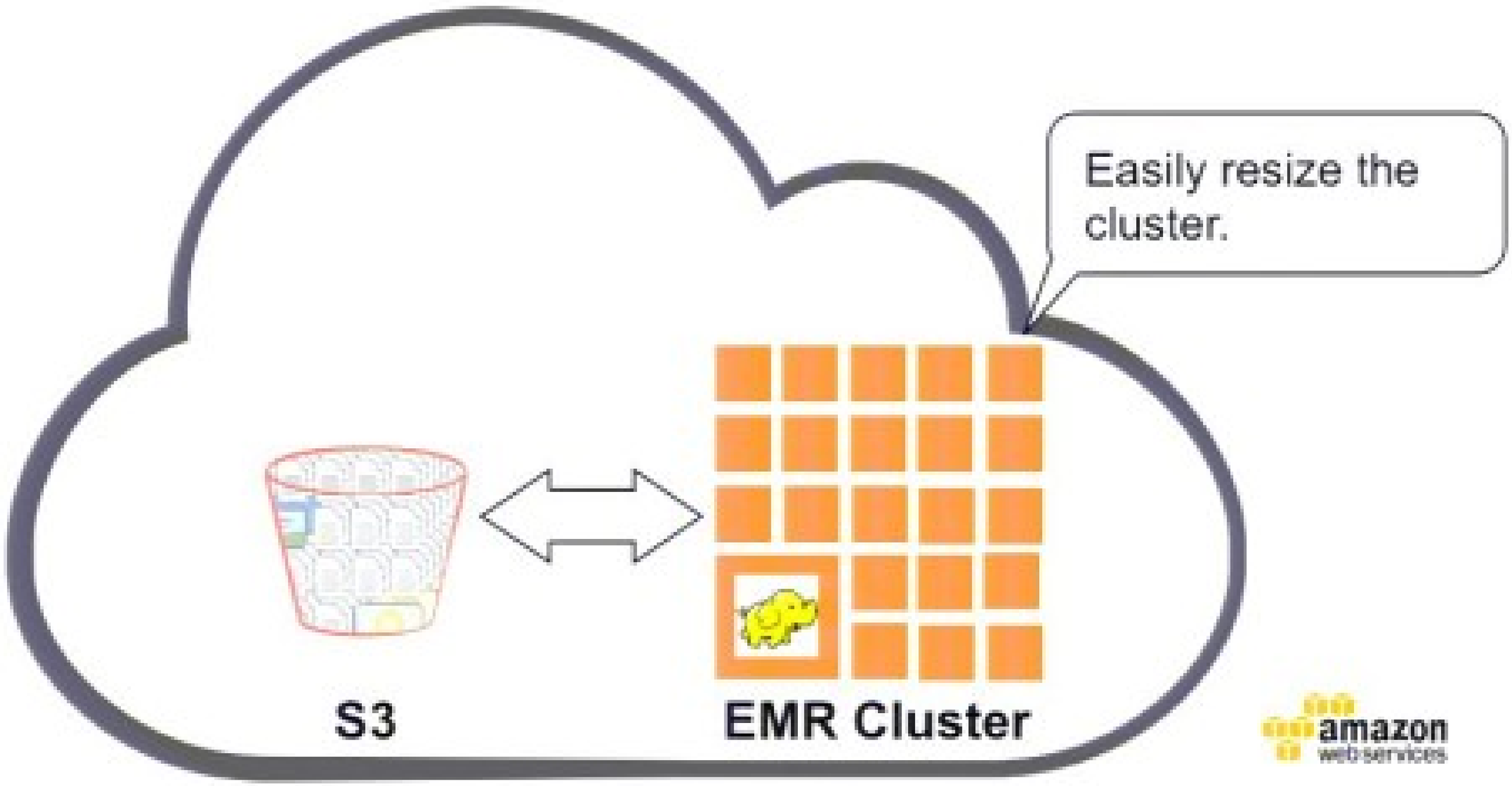
How does it work?

```
./elastic-mapreduce --create --stream \
--ami-version 3.0.3 \
--instance-type m1.small \
--num-instances 100 \
--arg "-files" \
--arg "s3://elasticmapreduce/samples/wordcount/wordSplitter.py" \
--input s3n://elasticmapreduce/samples/wordcount/input \
--mapper wordSplitter.py \
--reducer aggregate \
--output s3n://myawsbucket/output/2014-01-16
```

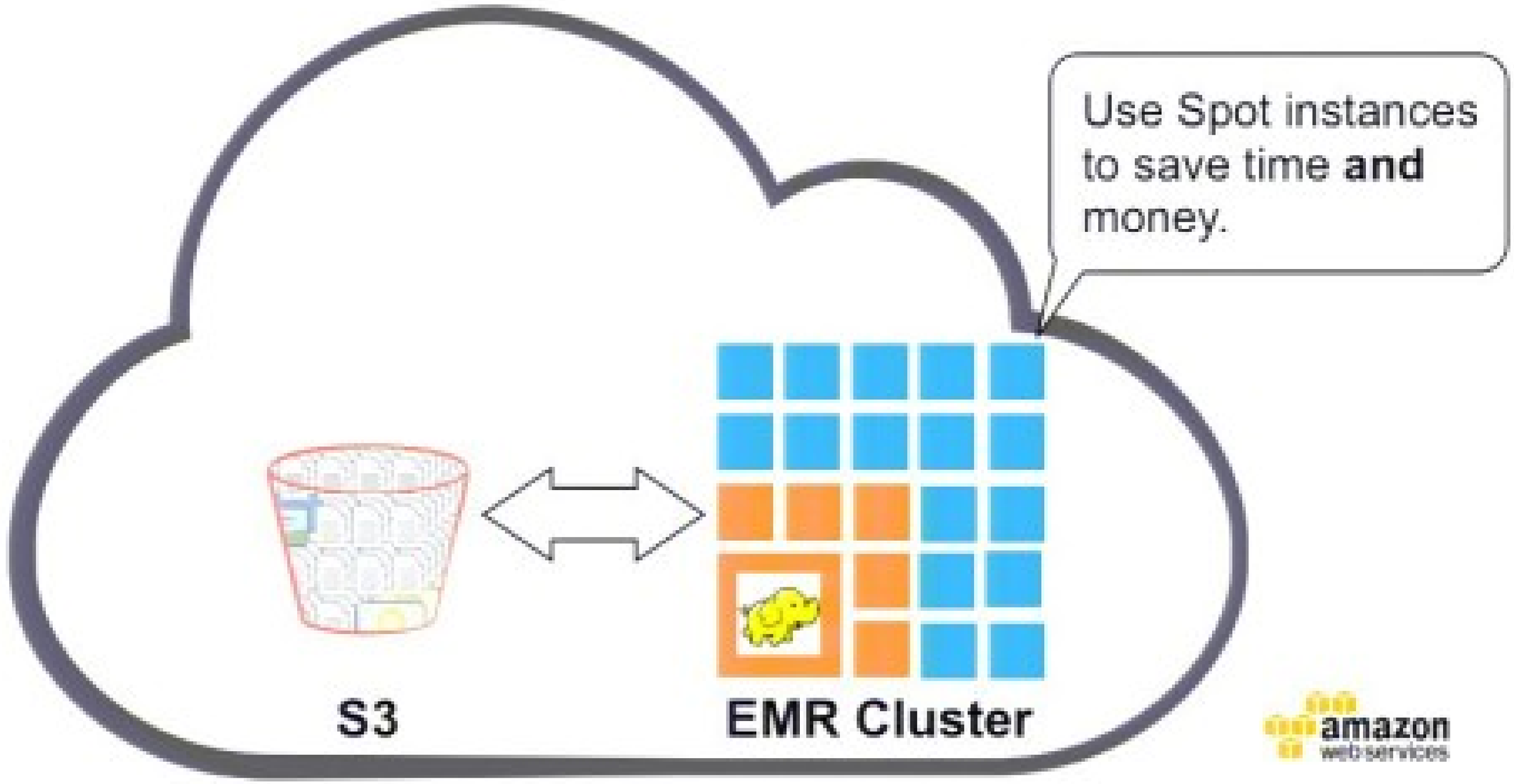
How does ist work?



How does ist work?

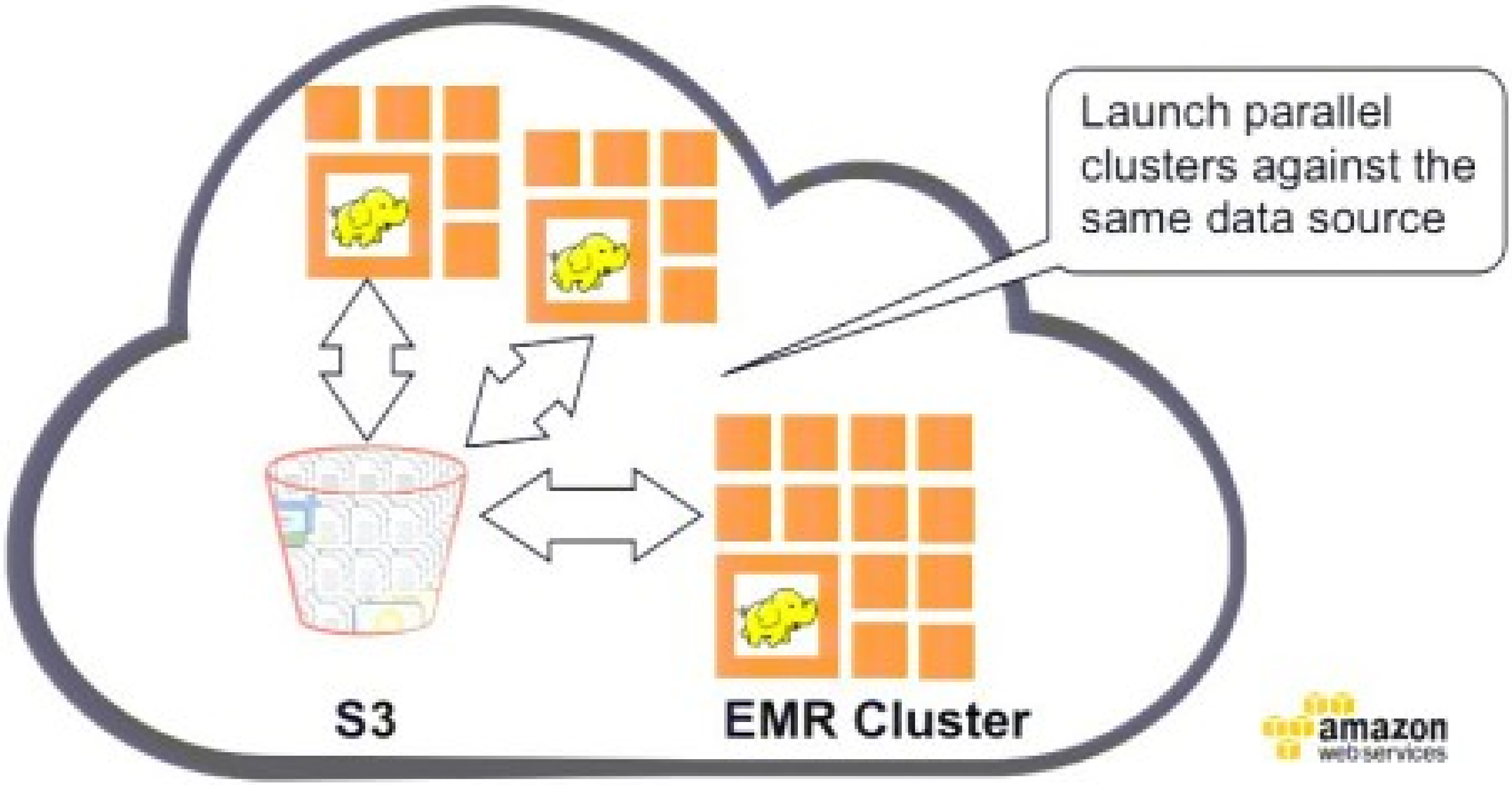


How does ist work?

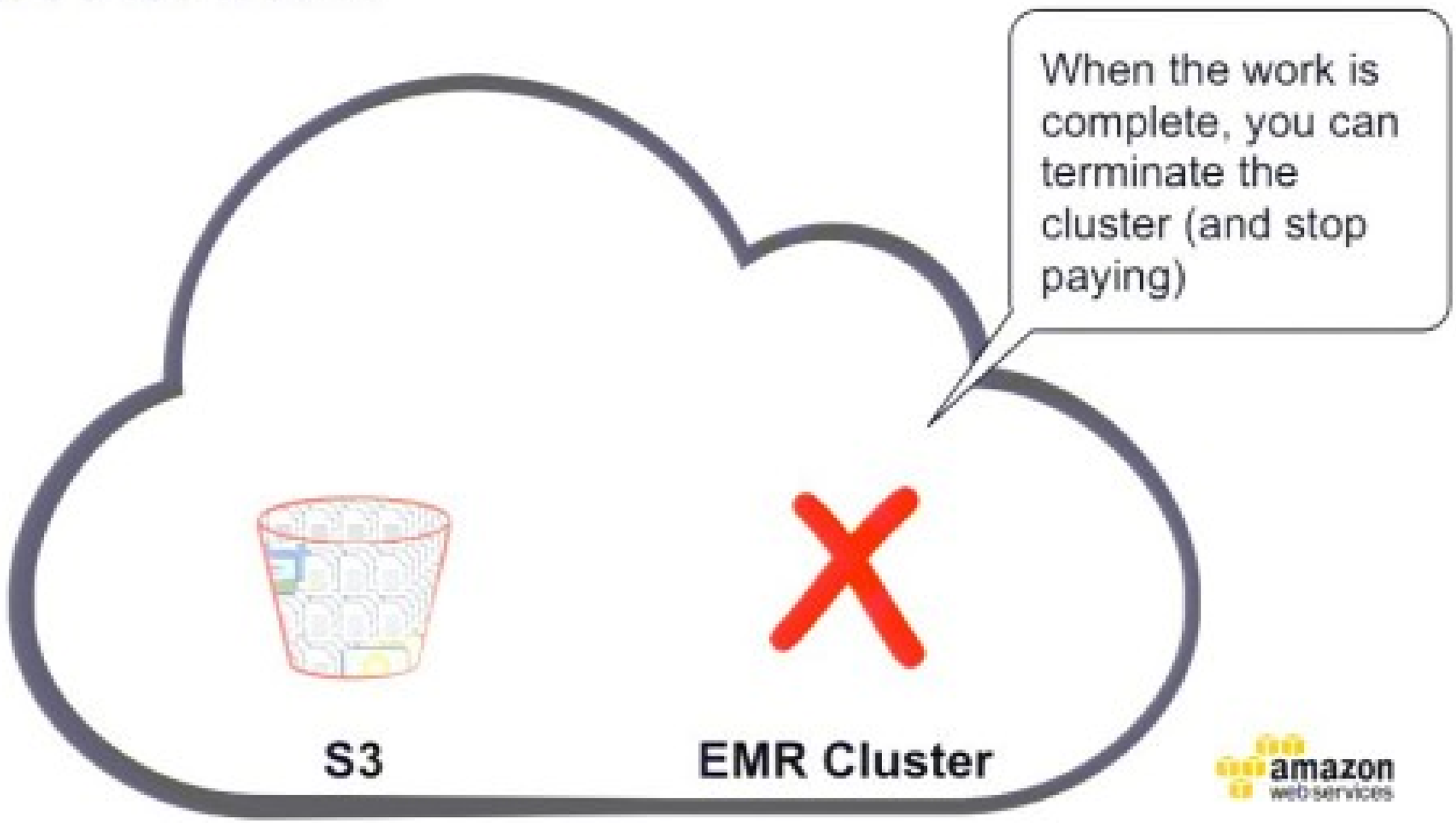


amazon web services

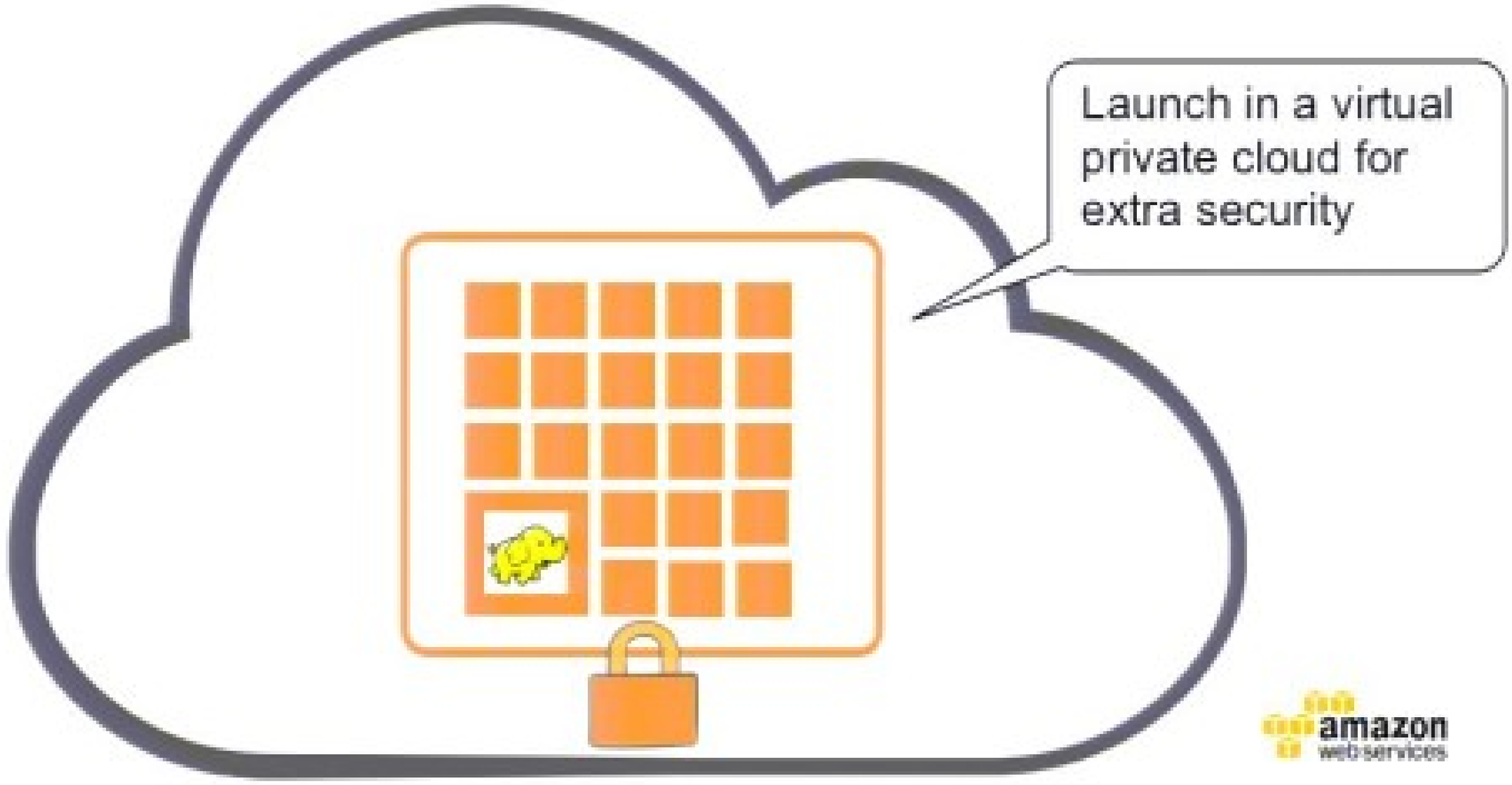
How does ist work?



How does ist work?



How does ist work?



Shared Responsibility for Security & Compliance

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Facilities
Physical Security
Compute Infrastructure
Storage Infrastructure
Network Infrastructure
Virtualization Layer

+

Customer

Operating System
Applications
Security Groups
Firewalls
Network Configuration
Account Management

=

You keep **100% control** over your data

amazon web services

Thousands of Customers, 5+ Millions of Clusters

The New York Times
Spotify
NETFLIX
So-net
razorfish
Etsy
NASDAQ OMX
foursquare
IMDb
playfish
amazon MP3
washingtonpost.com
ionflux
intuit
SAMSUNG
THE CLIMATE CORPORATION
amazon.com
backtype
yelp
ticketmaster
STANDARD &POOR'S
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Cost to run a 100 node Elastic MapReduce Cluster

Starting at EUR 4.24/hour
($5.80/h)

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Cost to run a 100 node Elastic MapReduce Cluster

+

What Would You Do with a 100 Node Supercomputer?

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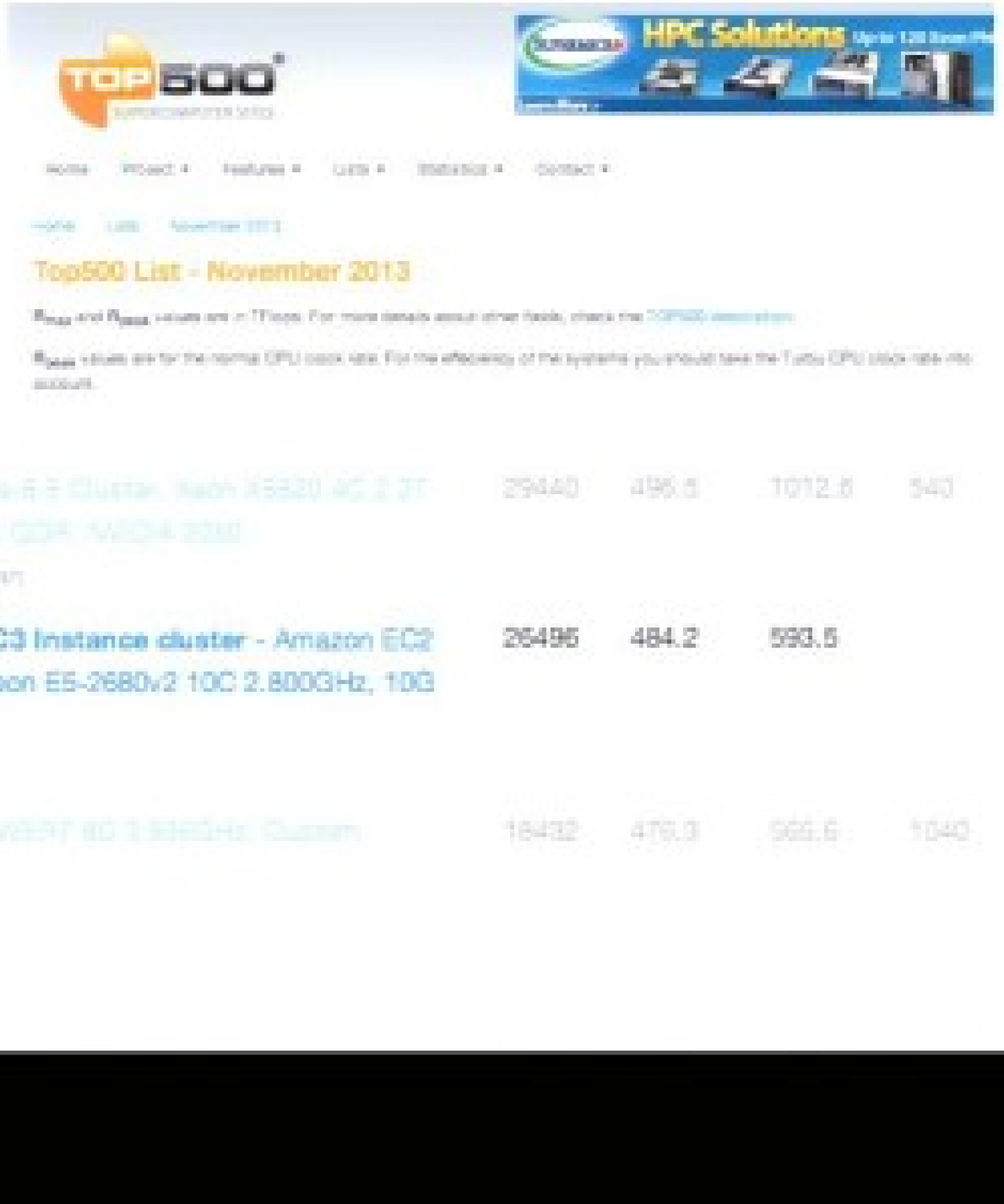
#64 on the November Top 500 List

- Intel Xeon 2.8 GHz
- 26,496 Cores
- 1656 Instances
- **$3166.272** per hour
- 484.2 TFlops



Biotech Customer quote:

"Getting onto the Top 500 list is now cheaper than running an ad on the Frankfurter Allgemeine!"

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Biology and Informatics research

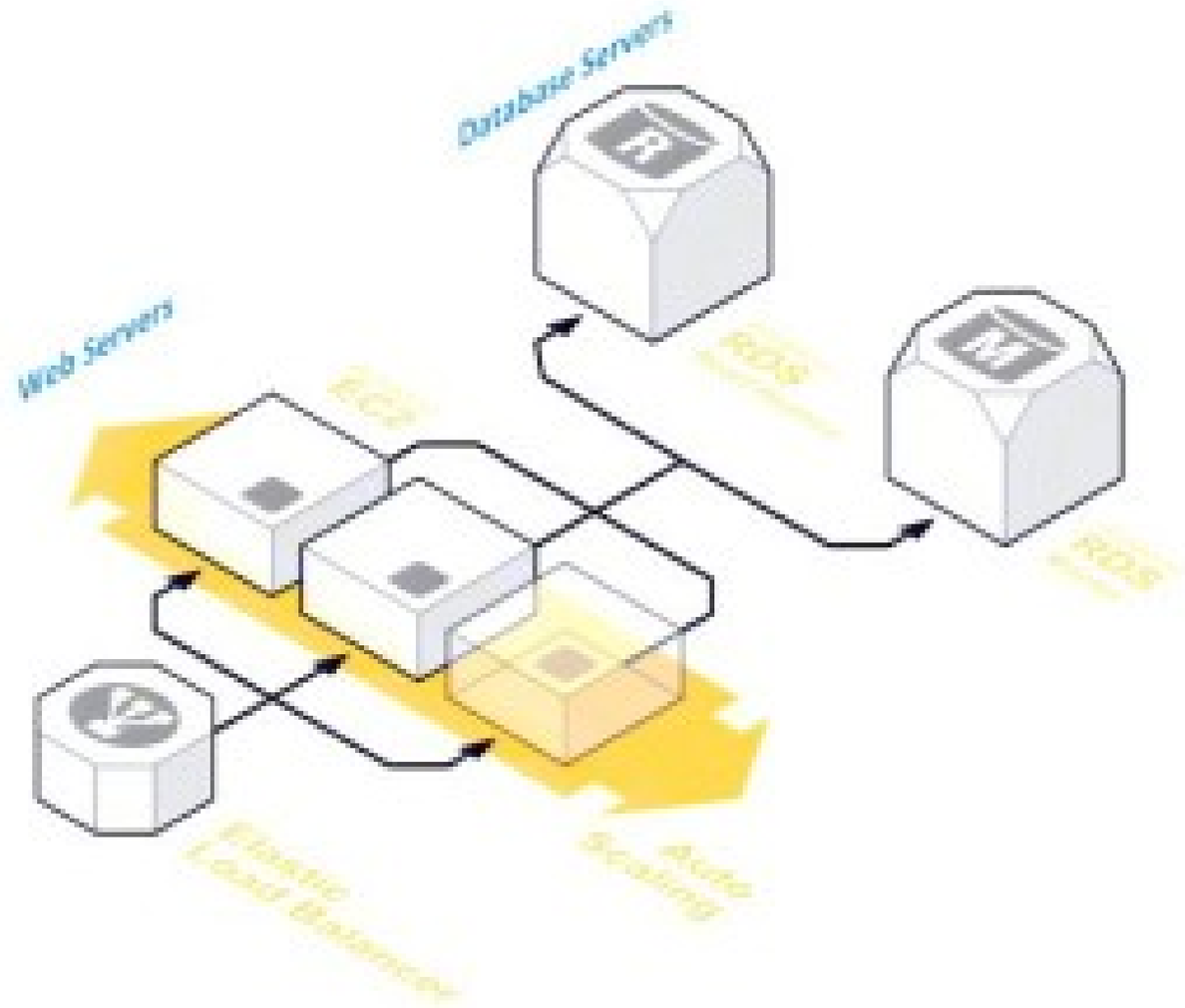
"The key advantage that AWS has over running this workflow on Unilever's existing cluster is the ability to scale up to a much larger number of parallel compute nodes on demand."

Pete Keeley, Unilever Researchs eScience IT Lead for Cloud Solutions

Unilever's digital data program now processes genetic sequences **twenty times faster**

“But I’m not a Big Data/HPC guy…”

Web Development


Database Servers
Web Servers
RDS
RDS
RDS
Elastic Load Balancer
Auto Scaling

Load Testing?

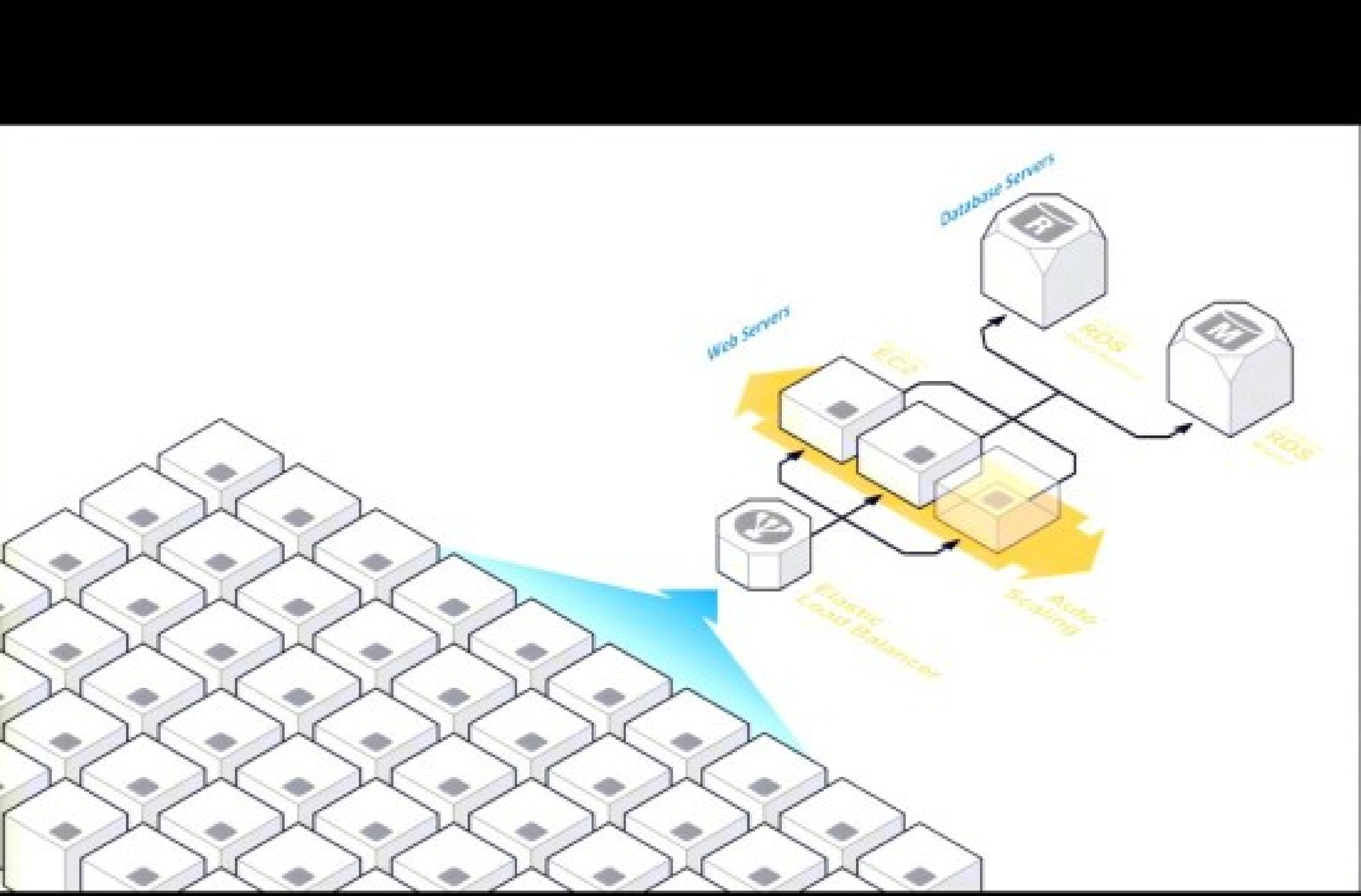
GitHub

newsapps / beeswithmachineguns

A utility for arming (creating) many bees (micro EC2 instances) to attack (load test) targets (web applications).
http://apps.chicagotribune.com/

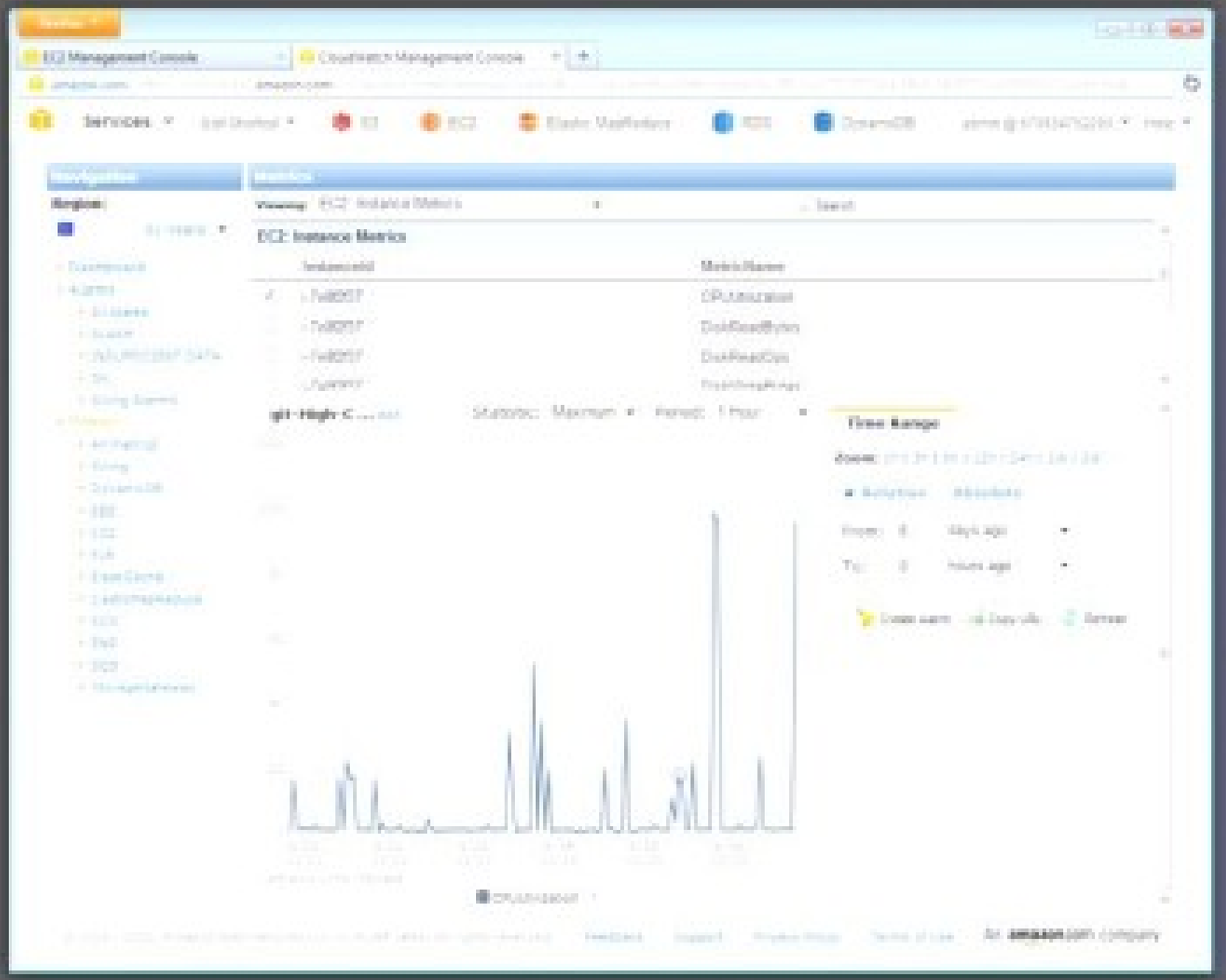
README.textile

Bees with Machine Guns!


Database Servers
Web Servers

```
$ fab -f bees.py up:2
Connecting to the hive.
Attempting to call up 2 bees.
Waiting for bees to load their machine guns...
.
.
.
.
Bee i-df450ab4 is ready for the attack.
.
Bee i-dd450ab6 is ready for the attack.
The swarm has assembled 2 bees.
Done.

$ fab -f bees.py attack:http://YOUR-DOMAIN.com/,1000,100
Read 2 bees from the roster.
Connecting to the hive.
Assembling bees.
Each of 2 bees will fire 500 rounds, 50 at a time.
Stinging URL so it will be cached for the attack.
[localhost] run: curl http://YOUR-DOMAIN.com/ >> /dev/null
Organizing the swarm.
Bee 0 is joining the swarm.
Bee 1 is joining the swarm.
Bee 0 is firing his machine gun. Bang bang!
Bee 1 is firing his machine gun. Bang bang!
Bee 0 is out of ammo.
Bee 1 lost sight of the target (connection timed out).
Offensive complete.
     Target failed to fully respond to 1 bees.
     Complete requests:          500
     Requests per second:        81.670000 [#/sec] (mean)
     Time per request:           612.188000 [ms] (mean)
     50% response time:          358.000000 [ms] (mean)
     90% response time:          1541.000000 [ms] (mean)
Mission Assessment: Target successfully fended off the swarm.
The swarm is awaiting new orders.
Done.
```


EC2 Management Console
CloudWatch Management Console
Services
EC2: Instance Metrics
Time Range:

CALL OF DUTY

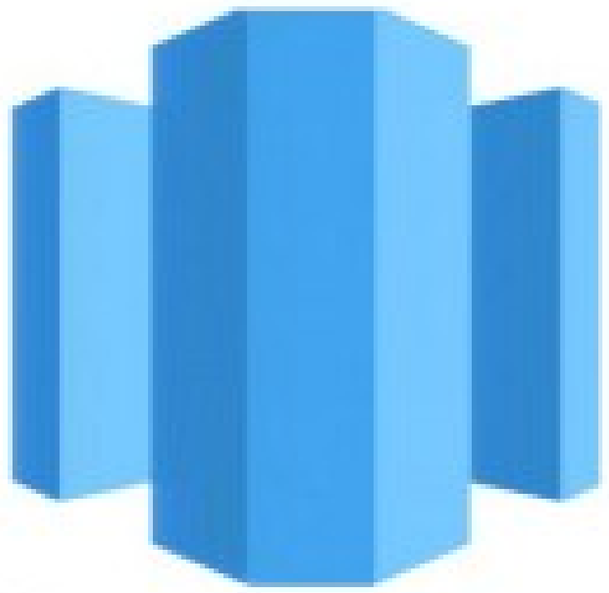
MW3


USING AMAZON EC2 TO SIMULATE
2.4 MILLION PLAYERS

Data Warehousing

Amazon Redshift

- **Easy** to provision, scale, operate
- No up-front costs, **pay-as-you-go**
- **Fast**: Columnar storage, compression, Specialized nodes
- **1-100** node clusters **2TB - 1.6PB**
- **$999** per TB per year
- Transparent **backups, restore, failover**
- **Security** in transit, at rest, for backups, VPC



Data Warehousing the AWS way

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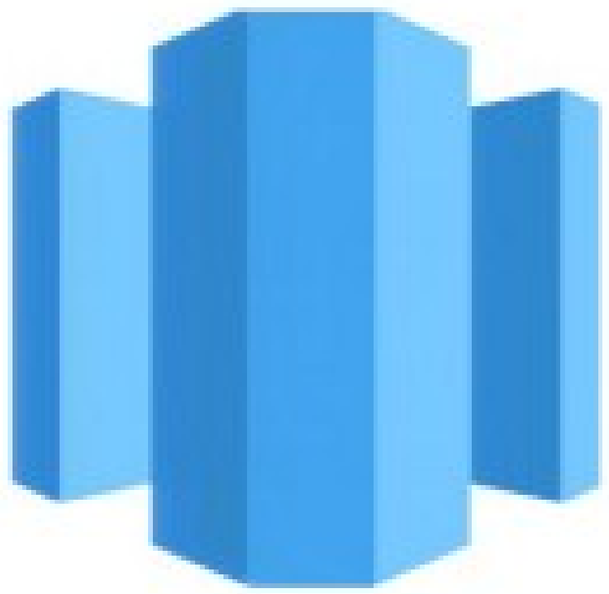
Amazon Redshift Results

amazon.com

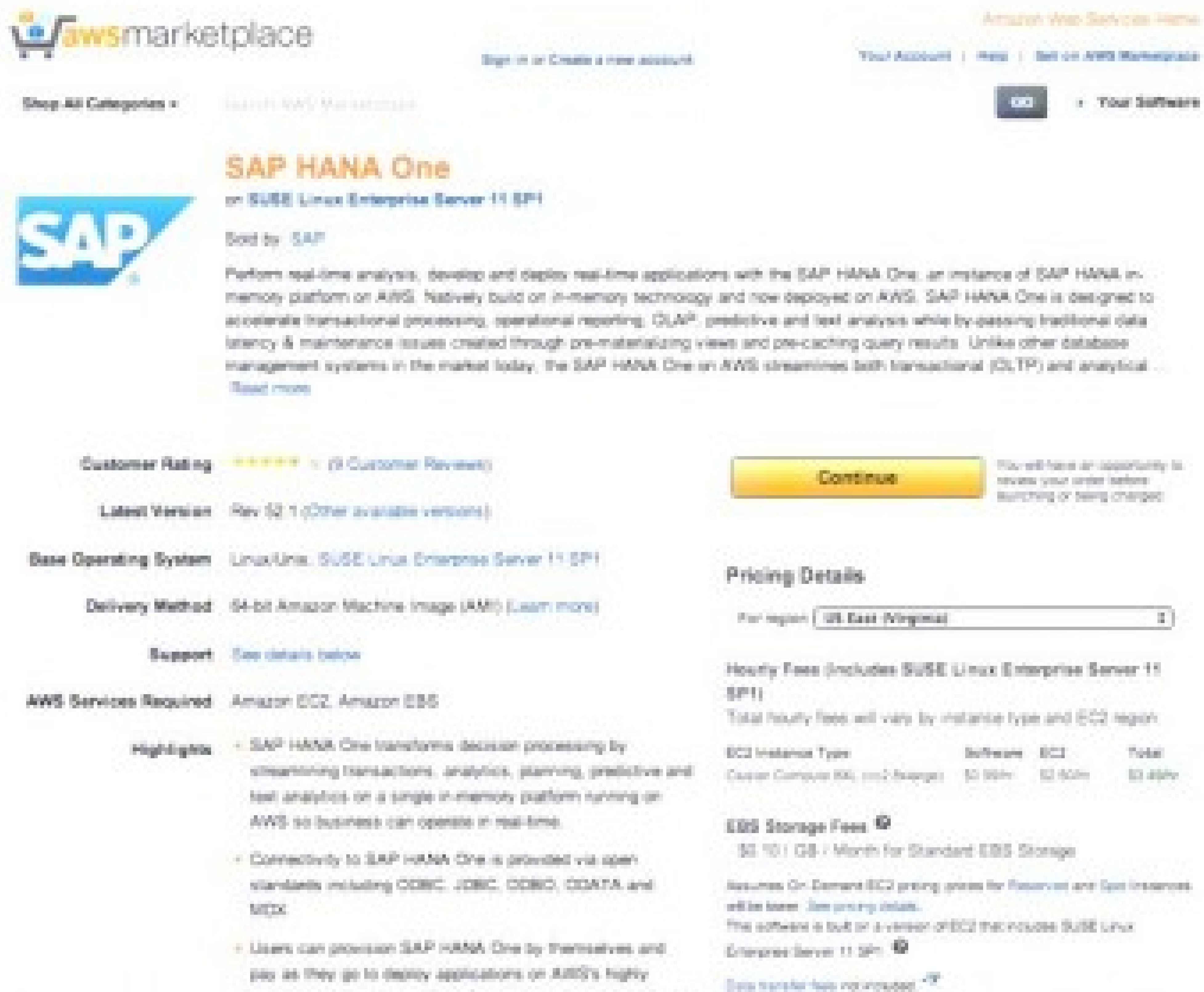
Current production environment:
32 nodes, 128 CPUs, 4.2TB RAM, 1.6 PB disk



Tested 2B row data set, 6 representative queries on a 2-node Amazon Redshift cluster

Result: **10x faster**

amazon web services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SAP HANA One
on SUSE Linux Enterprise Server 11 SP1
Sold by SAP
Read more
Customer Rating
Latest Version
Base Operating System
Delivery Method
Support
AWS Services Required
Highlights
Continue
Pricing Details
EBS Storage Fees

SAP HANA

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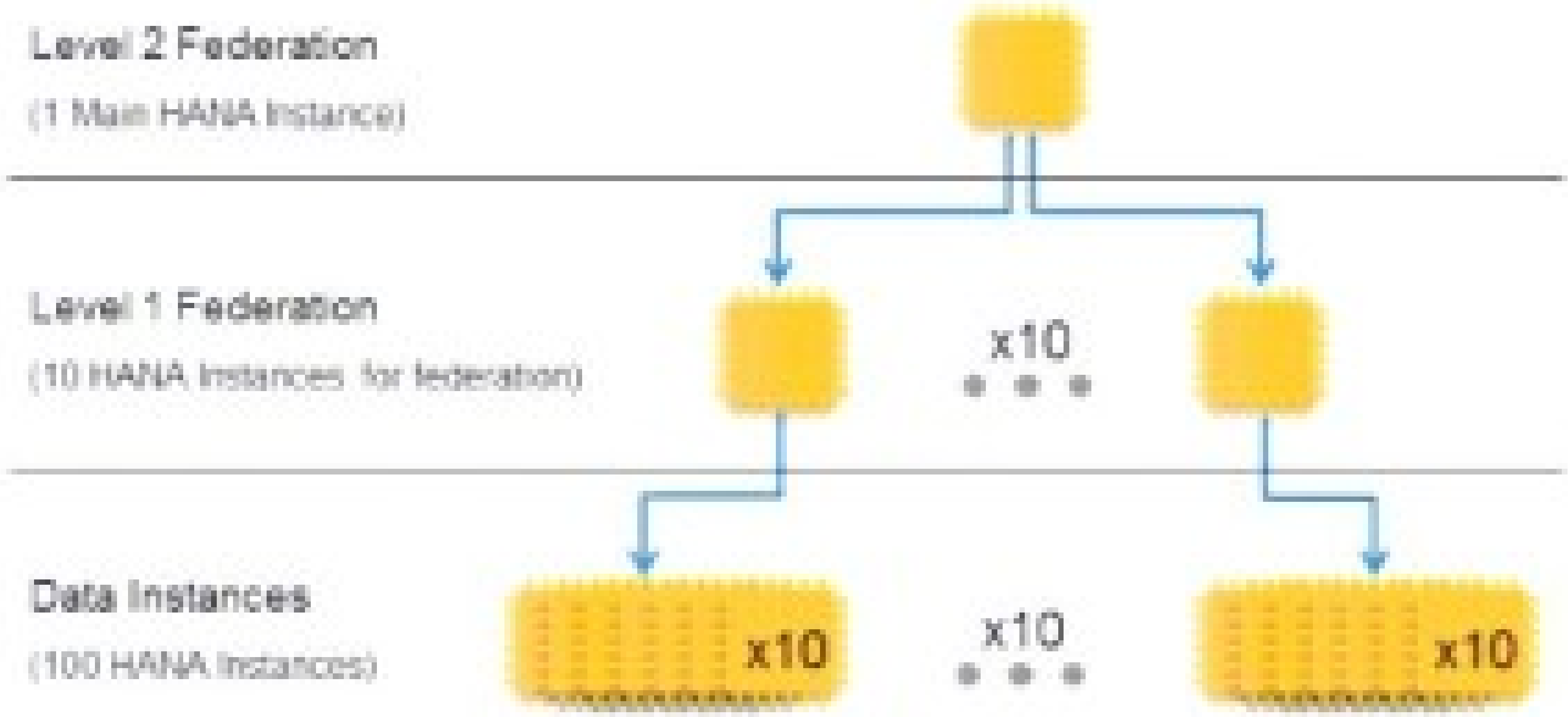
About HANA Learn Try Implement Marketplace Blog

Scalability test results for SAP Business Warehouse using In-Memory Data Fabric

- 8 Million rows per second loaded on 100 SAP HANA Instances
- 60 Billion rows analyzed in 330 milliseconds
- Near linear scalability



But:

It's Not About Size…

"On the Internet, nobody knows you're a dog."

It's about:

Democratization of IT

And...

"Want to increase innovation?
Lower the cost of failure."

– Joi Ito

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Experiment often

Fail quickly, at low cost

More Innovation

amazon web services

S&P Capital IQ

THE **SCALABLE NATURE** OF THE **CLOUD** ALLOWS US TO FIRE UP CLUSTERS OF COMPUTERS TO **PROCESS DATA** USING **HADOOP**, AND THOSE CLUSTERS CAN BE **CONFIGURABLE** IN TERMS OF THE NUMBER OF NODES, THE AMOUNT OF STORAGE AND THE AMOUNT OF **PROCESSING POWER**

– **Jeff Sternberg**
Chief Data Scientist

S&P CAPITAL IQ

Provides data to 4200+ top global investment firms

Launched Hadoop faster, Learned Hadoop faster

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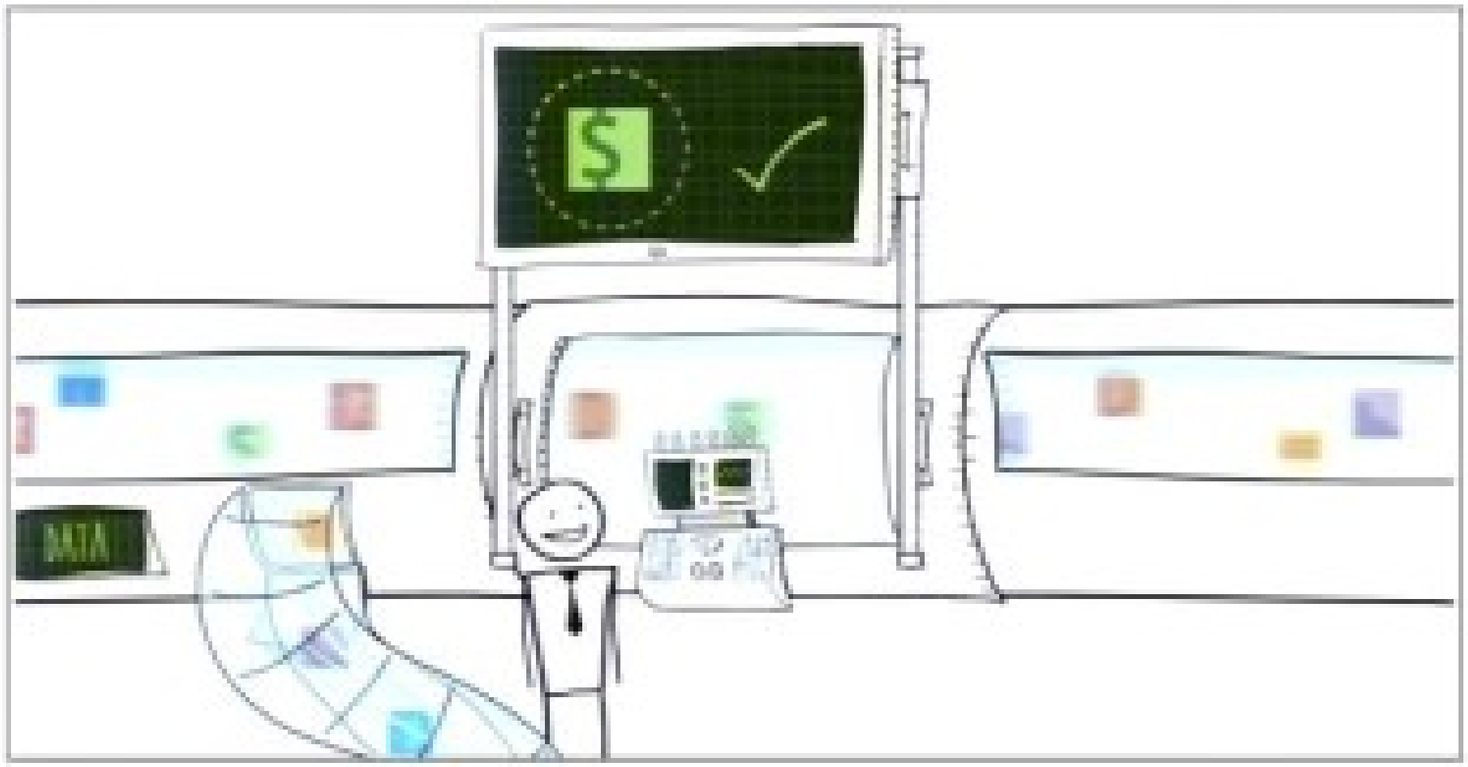
Real Time

New: Amazon Kinesis

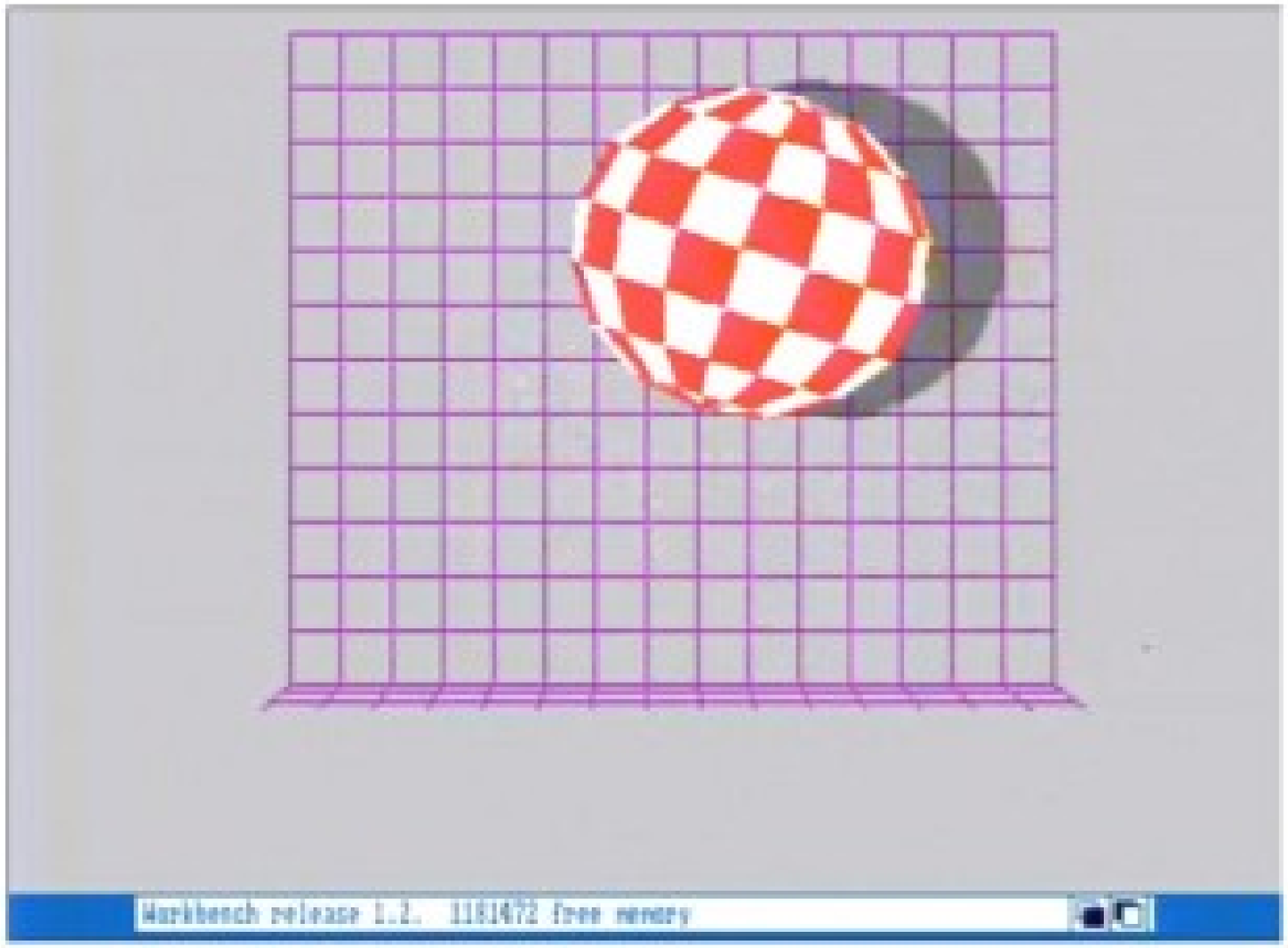
- Real-time processing
- Massive scale
- Integrated
- Use cases:
  - Real-time log analysis
  - Sensor data analytics
  - Social media monitoring
  - Financial transactions
  - Online machine learning



amazon web services

Amazon Kinesis Data Flow

Demo



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Kinesis Live Counter | AWS Kinesis Management | EC2 Management Console | Redshift - AWS Console

https://console.aws.amazon.com/kinesis/home?region=us-east-1#stream-d...

Services Edit Constantin Gonzalez N. Virginia Help

Amazon Kinesis Stream List > Stream Details Kinesis Help

Delete Stream

Summary for KinesisDemo-HttpReferrerPairs

Open Shards: 3 — Open shards both receive data from producers and make data available to consumers. This is the default state for a shard.

Closed Shards: 1 — Closed shards no longer accept data from producers. Data in these shards is still available to consumers, but only for 24 hours. Resharding operations result in closed shards.

Monitoring

Time range: Last hour All graphs are displayed in the UTC time zone.

Write Capacity (Bytes/second)

Read Capacity (Bytes/second)

Put Latency (Milliseconds)

Get Latency (Milliseconds)

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Kinesis Live Counter | AWS Kinesis Management | EC2 Management Console | Redshift - AWS Console

https://console.aws.amazon.com/kinesis/home?region=us-east-1#stream-li...

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Amazon Kinesis Streams List Kinesis Help

Create Stream Delete Stream

Filter:

Stream Name	Number of Shards	Status

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Kinesis Live Counter | AWS Kinesis Management | EC2 Management Console | Redshift - AWS Console

https://console.aws.amazon.com/kinesis/home?region=us-east-1#stream-li...

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Amazon Kinesis Stream List Kinesis Help

Create Stream Delete Stream

Filter:

Stream Name	Number of Shards	Status
KinesisDemo-HttpRefererPairs	3	ACTIVE

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Kinesis Live Counter | AWS Kinesis Management | EC2 Management Console | Redshift - AWS Console

https://console.aws.amazon.com/kinesis/home?region=us-east-1#stream-d...

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Amazon Kinesis Stream List > Stream Details Kinesis Help

Delete Stream

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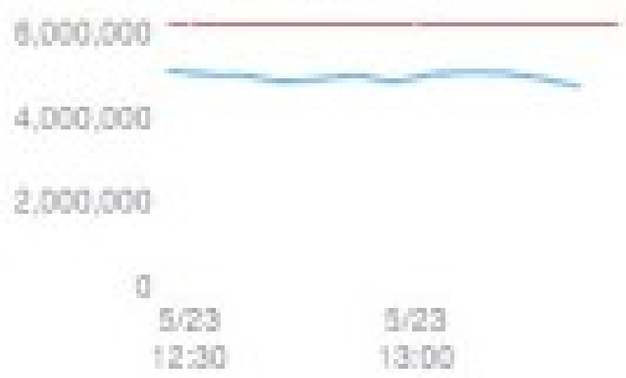

Put Latency (Milliseconds)

Get Latency (Milliseconds)

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Kinesis Live Counter | AWS Kinesis Management | EC2 Management Console | Redshift - AWS Console

https://console.aws.amazon.com/ec2/v2/home?region=us-east-1#instances:

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EC2 Dashboard
Events
Tags
Reports

INSTANCES
Instances
Spot Requests
Reserved Instances

IMAGES
AMIs
Bundle Tasks

ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces

Launch Instance Actions

Filter: All instances All instance types Search Instances

1 to 5 of 5 Instances

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm
KinesisDemo	i-a9822afa	m1.large	us-east-1b	running	2/2 checks...	No

Select an instance above

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EC2 Dashboard
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Reserved Instances

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AMIs
Bundle Tasks

ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces

Resources

You are using the following Amazon EC2 resources in the US East (N. Virginia) region:

5 Running Instances
5 Volumes
6 Key Pairs
0 Placement Groups
3 Elastic IPs
2 Snapshots
0 Load Balancers
21 Security Groups

Focus on application development and offload database management to AWS - Try Amazon RDS Now!

Hide

Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

Launch Instance

Note: Your instances will launch in the US East (N. Virginia) region

Service Health

Service Status:

US East (N. Virginia):
This service is operating normally

Availability Zone Status:

Scheduled Events

US East (N. Virginia):

No events

Account Attributes

Supported Platforms
EC2
VPC

Additional Information

Getting Started Guide
Documentation
All EC2 Resources
Forums
Pricing
Contact Us

AWS Marketplace

Find **free software trial** products in the AWS Marketplace from the EC2 Launch Wizard.
Or try these popular AMIs:

Vyatta Virtual Router/Firewall/VPN

Provided by Vyatta, Inc.
Rating ★★★★★
Pay by the hour for software

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Kinesis Live Counter | AWS Kinesis Management | EC2 Management Console | Redshift - AWS Console

https://console.aws.amazon.com/ec2/v2/home?region=us-east-1#instances:

Services Edit Constantin Gonzalez N. Virginia Help

EC2 Dashboard
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INSTANCES
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IMAGES
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ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces

Launch Instance Actions

Filter: All instances All instance types Search Instances

1 to 5 of 5 Instances

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm
KinesisCons...	i-3574ad65	m1.small	us-east-1a	running	2/2 checks...	No
KinesisCons...	i-9574cdc6	m1.small	us-east-1b	running	2/2 checks...	No
KinesisCons...	i-253bd977	m1.small	us-east-1d	running	2/2 checks...	No
KinesisDemo	i-20ff4173	m1.medium	us-east-1b	running	2/2 checks...	No
KinesisDemo	i-a9922afa	m1.large	us-east-1b	running	2/2 checks...	No

Select an instance above

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Kinesis Live Counter | AWS Kinesis Management | EC2 Management Console | Redshift - AWS Console

https://console.aws.amazon.com/ec2/v2/home?region=us-east-1#Instances:

Services Edit Constantin Gonzalez N. Virginia Help

EC2 Dashboard
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1 to 5 of 5 Instances

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm
KinesisCons...	i-3574ed65	m1.small	us-east-1a	running	2/2 checks...	No
KinesisCons...	i-9574cdc6	m1.small	us-east-1b	running	2/2 checks...	No
KinesisCons...	i-253bd977	m1.small	us-east-1d	running	2/2 checks...	No
KinesisDemo	i-20ff4173	m1.medium	us-east-1b	running	2/2 checks...	No
KinesisDemo	i-a9922afa	m1.large	us-east-1b	running	2/2 checks...	No

Instances: i-3574ed65 (KinesisConsumerApp), i-9574cdc6 (KinesisConsumerApp), i-253bd977 (KinesisConsumerApp)

Description Status Checks Monitoring Tags

i-3574ed65: ec2-54-237-188-167.compute-1.amazonaws.com
i-9574cdc6: ec2-23-22-5-5.compute-1.amazonaws.com
i-253bd977: ec2-54-83-145-168.compute-1.amazonaws.com

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Kinesis Live Counter | AWS Kinesis Management | EC2 Management Console | Redshift - AWS Console

https://console.aws.amazon.com/ec2/v2/home?region=us-east-1#Instances:

Services Edit Constantin Gonzalez N. Virginia Help

EC2 Dashboard
Events
Tags
Reports

INSTANCES
Instances
Spot Requests
Reserved Instances

IMAGES
AMIs
Bundle Tasks

ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces

Launch Instance Actions

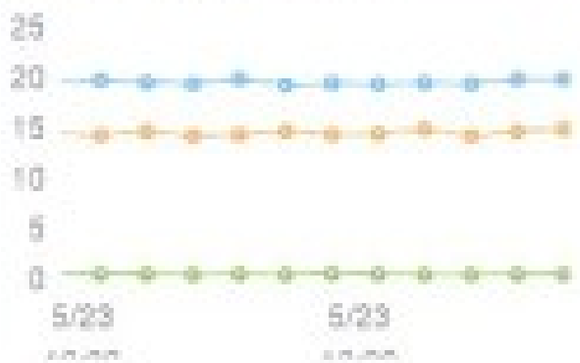
Filter: All instances All instance types Search Instances

1 to 5 of 5 Instances

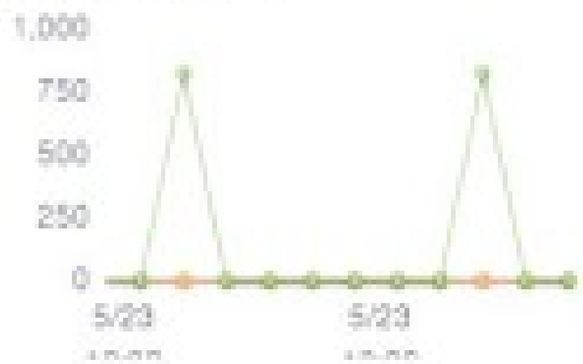
Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm
KinesisCons...	i-3574ad65	m1.small	us-east-1a	running	2/2 checks...	No
KinesisCons...	i-9574cdc6	m1.small	us-east-1b	running	2/2 checks...	No
KinesisCons...	i-253bd977	m1.small	us-east-1d	running	2/2 checks...	No
KinesisDemo	i-20ff4173	m1.medium	us-east-1b	running	2/2 checks...	No
KinesisDemo	i-a9922afa	m1.large	us-east-1b	running	2/2 checks...	No

Below are your CloudWatch metrics for the selected resources (a maximum of 10). Click on a graph to see an expanded view. All times shown are in UTC. View all CloudWatch metrics

CPU Utilization (Percent)



Disk Reads (Bytes)



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Kinesis Live Counter | AWS Kinesis Management | EC2 Management Console | Redshift - AWS Console

https://console.aws.amazon.com/redshift/home?region=us-east-1#security:...

Services Edit Constantin Gonzalez N. Virginia Help

Amazon Redshift

- Clusters
- Snapshots
- **Security**
- Parameter Groups
- Reserved Nodes
- Events

Security Groups | Subnet Groups | HSM Connections | HSM Certificates

Filter: Search... Viewing 1 of 1 Cluster Security Groups

Name	Status	Description
default	authorized	default

Cluster Security Group: default

Connection Type	Details	Status	Action
CIDR/IP	**CIDR/IP:** 80.187.106.10/32	authorized	Revoke
CIDR/IP	**CIDR/IP:** 80.187.107.22/32	authorized	Revoke
EC2 Security Group	**AWS Account ID:** 979400686812 **EC2 Security Group:** kinesisredshiftapp-ec2securitygroup-10qfjcg4i5ddl	authorized	Revoke

Connection Type CIDR/IP **CIDR/IP of your current machine** 80.187.106.10/32 **Authorize**

CIDR/IP to Authorize* 80.187.106.10/32

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Chrome File Edit View History Bookmarks Window Help 100 % Fr. 15:28

Kinesis Live Counter | AWS Kinesis Management | EC2 Management Console | Redshift - AWS Console

https://console.aws.amazon.com/redshift/home?region=us-east-1#cluster-...

Services Edit Constantin Gonzalez N. Virginia Help

Amazon Redshift

- Clusters
- Snapshots
- Security
- Parameter Groups
- Reserved Nodes
- Events

Cluster: kinesisredshiftapp-kinesiscluster-n2ea2k3gg7bl

Configuration | Status | Performance | Queries | Loads

Cluster: kinesisredshiftapp-kinesiscluster-n2ea2k3gg7bl

Cluster Database Backup

Cluster Properties

Cluster Name:	kinesisredshiftapp-kinesiscluster-n2ea2k3gg7bl
Cluster Type:	Multi Node
Node Type:	dw1.xlarge
Nodes:	2
Zone:	us-east-1d
Created Time:	2014 May 22 14:50:13 UTC+2
Cluster Version:	1.0.789
Cluster Security Groups:	default (active)
Cluster Parameter Group:	default.redshift-1.0 (in-sync)

Cluster Status

Cluster Status:	available
Database Health:	healthy
In Maintenance Mode:	no
Parameter Group Apply Status:	in-sync
Pending Modified Values:	None

Cluster Database Properties

Endpoint:	kinesisredshiftapp-kinesiscluster-n2ea2k3gg7bl.c7fas3buzm6i.us-east-1.redshift.amazonaws.com
Port:	8192

Backup, Audit Logging, and Maintenance

Automated Snapshot Retention Period:	1
Cross-Region Snapshots Enabled:	No
Audit Logging Enabled:	No
Maintenance Window:	mon:07:00-

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Kinesis Live Counter | AWS Kinesis Management | EC2 Management Console | Redshift - AWS Console

https://console.aws.amazon.com/redshift/home?region=us-east-1#cluster-...

Services Edit Constantin Gonzalez N. Virginia Help

Amazon Redshift

- Clusters
- Snapshots
- Security
- Parameter Groups
- Reserved Nodes
- Events

Cluster: kinesisredshiftapp-kinesiscluster-n2ea2k3gg7bl

Configuration | Status | Performance | Queries | Loads

Cluster Properties

Cluster Name:	kinesisredshiftapp-kinesiscluster-n2ea2k3gg7bl
Cluster Type:	Multi Node
Node Type:	dw1.xlarge
Nodes:	2
Zone:	us-east-1d
Created Time:	2014 May 22 14:50:13 UTC+2
Cluster Version:	1.0.789
Cluster Security Groups:	default (active)
Cluster Parameter Group:	default.redshift-1.0 (in-sync)

Cluster Status

Cluster Status:	available
Database Health:	healthy
In Maintenance Mode:	no
Parameter Group Apply Status:	in-sync
Pending Modified Values:	None

Cluster Database Properties

Endpoint:	kinesisredshiftapp-kinesiscluster-n2ea2k3gg7bl.c7fas3buzm8i.us-east-1.redshift.amazonaws.com
Port:	8192
Database Name:	kinesisdatabase
Master Username:	dbuser
Encrypted:	No

Backup, Audit Logging, and Maintenance

Automated Snapshot Retention Period:	1
Cross-Region Snapshots Enabled:	No
Audit Logging Enabled:	No
Maintenance Window:	mon:07:00-mon:07:30
Allow Version Upgrade:	Yes

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SQL Workbench File Edit View Data SQL Macros Workspace Tools Help 100 % Fr. 15:28

SQL Workbench/J – Kinesis Demo – Default.wksp

User=dbuser, URL=jdbc:postgresql://kinesisredshiftap

Statement 1

```
1 SELECT COUNT(*) FROM Kinesisbasictable;
2 SELECT COUNT(*) FROM Kinesisbasictable WHERE referrer like '%google%';
3 SELECT * FROM Kinesisbasictable LIMIT 200;
4
```

Messages

Ready, if you are | L:3 C:42 | Timeout: 0 | Max. Rows: 0

SQL Workbench File Edit View Data SQL Macros Workspace Tools Help 100 % Fr. 15:28

SQL Workbench/J – Kinesis Demo – Default.wksp

User=dbuser, URL=jdbc:postgresql://kinesisredshiftap

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1 SELECT COUNT(*) FROM Kinesisbasictable;
2 SELECT COUNT(*) FROM Kinesisbasictable WHERE referrer like '%google%';
3 SELECT * FROM Kinesisbasictable LIMIT 200;
4
```

Result | Messages

id	resource	referrer
1	/getting_started.html	http://www.amazon.com
6	/getting_started.html	http://www.reddit.com
11	/tips.html	http://www.amazon.com
14	/users.html	http://www.yahoo.com
20	/users.html	http://www.yahoo.com
1	/services.html	http://www.bing.com
6	/careers.html	http://www.reddit.com
11	/help.html	http://www.amazon.com
14	/careers.html	http://www.bing.com
20	/services.html	http://www.yahoo.com
1	/index.html	http://www.google.com
6	/index.html	http://www.yahoo.com
11	/blog.html	http://www.reddit.com
14	/blog.html	/index.html
20	/blog.html	/index.html

Ready, if you are | L:3 C:42 | 0.6s | Timeout: 0 | Max. Rows: 0 | 1-15/200

SQL Workbench File Edit View Data SQL Macros Workspace Tools Help 100 % Fr. 15:28

SQL Workbench/J – Kinesis Demo – Default.wksp

User=dbuser, URL=jdbc:postgresql://kinesisredshiftap

Statement 1

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Result | Messages

id	resource	referrer
1	/getting_started.html	http://www.amazon.com
6	/getting_started.html	http://www.reddit.com
11	/tips.html	http://www.amazon.com
14	/users.html	http://www.yahoo.com
20	/users.html	http://www.yahoo.com
1	/services.html	http://www.bing.com
6	/careers.html	http://www.reddit.com
11	/help.html	http://www.amazon.com
14	/careers.html	http://www.bing.com
20	/services.html	http://www.yahoo.com
1	/index.html	http://www.google.com
6	/index.html	http://www.yahoo.com
11	/blog.html	http://www.reddit.com
14	/blog.html	/index.html
20	/blog.html	/index.html

Ready, if you are | L:3 C:42 | 0.6s | Timeout: 0 | Max. Rows: 0 | 1-15/200

SQL Workbench File Edit View Data SQL Macros Workspace Tools Help 100 % Fr. 15:28

SQL Workbench/J – Kinesis Demo – Default.wksp

User=dbuser, URL=jdbc:postgresql://kinesisredshiftap

Statement 1

```
1 SELECT COUNT(*) FROM kinesisbasictable;
2 SELECT COUNT(*) FROM Kinesisbasictable WHERE referrer like '%google%';
3 SELECT * FROM Kinesisbasictable LIMIT 200;
4
```

Result | Messages

count
4765904

Ready, if you are | L:1 C:22 | 0.18s | Timeout: 0 | Max. Rows: 0 | 1-1/1

SQL Workbench File Edit View Data SQL Macros Workspace Tools Help 100 % Fr. 15:28

SQL Workbench/J – Kinesis Demo – Default.wksp

User=dbuser, URL=jdbc:postgresql://kinesisredshiftap

Statement 1

```
1 SELECT COUNT(*) FROM kinesisbasictable;
2 SELECT COUNT(*) FROM kinesisbasictable WHERE referrer like '%google%';
3 SELECT * FROM kinesisbasictable LIMIT 200;
4
```

Result | Messages

count
4765904

Ready, if you are | L:1 C:22 | 0.18s | Timeout: 0 | Max. Rows: 0 | 1-1/1

SQL Workbench/J – Kinesis Demo – Default.wksp

User=dbuser, URL=jdbc:postgresql://kinesisredshiftap

Statement 1

```
1 SELECT COUNT(*) FROM Kinesisbasictable;
2 SELECT COUNT(*) FROM Kinesisbasictable WHERE referrer like '%google%';
3 SELECT * FROM Kinesisbasictable LIMIT 200;
4
```

Result | Messages

count
4765904

Ready, if you are | L:2 C:23 | 0.18s | Timeout: 0 | Max. Rows: 0 | 1-1/1

SQL Workbench File Edit View Data SQL Macros Workspace Tools Help 100 % Fr. 15:28

» SQL Workbench/J – Kinesis Demo – Default.wksp

User=dbuser, URL=jdbc:postgresql://kinesisredshiftap

Statement 1

```
1 SELECT COUNT(*) FROM Kinesisbasictable;
2 SELECT COUNT(*) FROM Kinesisbasictable WHERE referrer like '%google%';
3 SELECT * FROM Kinesisbasictable LIMIT 200;
4
```

Messages

Executing statement... L:2 C:23 0.18s Timeout: 0 Max. Rows: 0 1-1/1

SQL Workbench File Edit View Data SQL Macros Workspace Tools Help 100 % Fr. 15:28

SQL Workbench/J – Kinesis Demo – Default.wksp

User=dbuser, URL=jdbc:postgresql://kinesisredshiftap

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```
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2 SELECT COUNT(*) FROM Kinesisbasictable WHERE referrer like '%google%';
3 SELECT * FROM Kinesisbasictable LIMIT 200;
4
```

Result | Messages

count
699466

Ready, if you are | L:2 C:23 | 1.27s | Timeout: 0 | Max. Rows: 0 | 1-1/1

SQL Workbench File Edit View Data SQL Macros Workspace Tools Help 100 % Fr. 15:29

SQL Workbench/J – Kinesis Demo – Default.wksp

User=dbuser, URL=jdbc:postgresql://kinesisredshiftap

Statement 1

```
1 SELECT COUNT(*) FROM Kinesisbasictable;
2 SELECT COUNT(*) FROM Kinesisbasictable WHERE referrer like '%google%';
3 SELECT * FROM Kinesisbasictable LIMIT 200;
4
```

Result | Messages

count
699466

Ready, if you are | L:2 C:23 | 1.27s | Timeout: 0 | Max. Rows: 0 | 1-1/1

Keynote File Edit Insert Slide Format Arrange View Play Window Share Help 100 % Fr. 15:29

2014-05-22_Democratizing_Supercomputers.key

New Play View Guides Themes Masters Text Box Shapes Table Charts Comment Mask Alpha Group Ungroup Front

Master Slides

Default – Title Slide

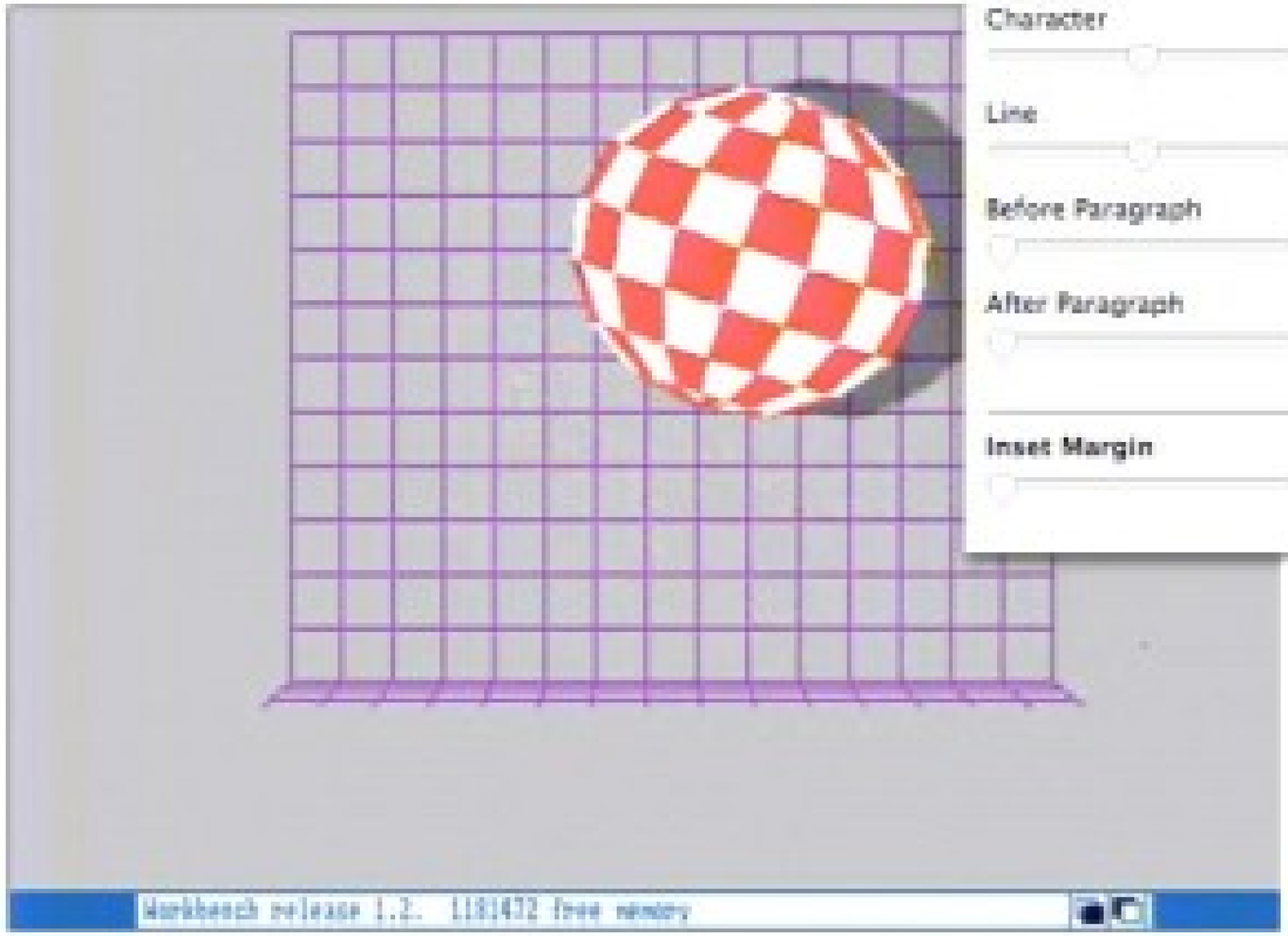
Default – Title Only

Default – Blank

Slides

62 63 64 65 66 67

Demo



Workbench release 1.2. 1181432 free memory

75%

Text

Text Columns Bullets

Color & Alignment

Spacing

Automatically Shrink Text

Character

Line

Before Paragraph

After Paragraph

Inset Margin

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Keynote File Edit Insert Slide Format Arrange View Play Window Share Help 100 % Fr. 15:29

Play Slideshow ⌥⌘P
Record Slideshow
Clear Recording
Rehearse Slideshow
Customize Presenter Display...

2014-05-22_Democrati

New Play View Guides Themes Masters Text Box Shapes Table Charts

Master Slides
Default – Title Slide
Default – Title Only
Default – Blank
Slides
62
63
64
65
66
67

Demo

Text
Text Columns Bullets
Color & Alignment
Spacing
Automatically Shrink Text
Character
Line
Before Paragraph
After Paragraph
Inset Margin

Workbench release 1.2. 1181422 free memory

75%

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2014-05-22_
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What Would You Do with a 100 Node Supercomputer?

amazon web services

Try It Out Now

aws.amazon.com

amazon web services

Thank you!

Constantin Gonzalez
Solutions Architect
glez@amazon.de