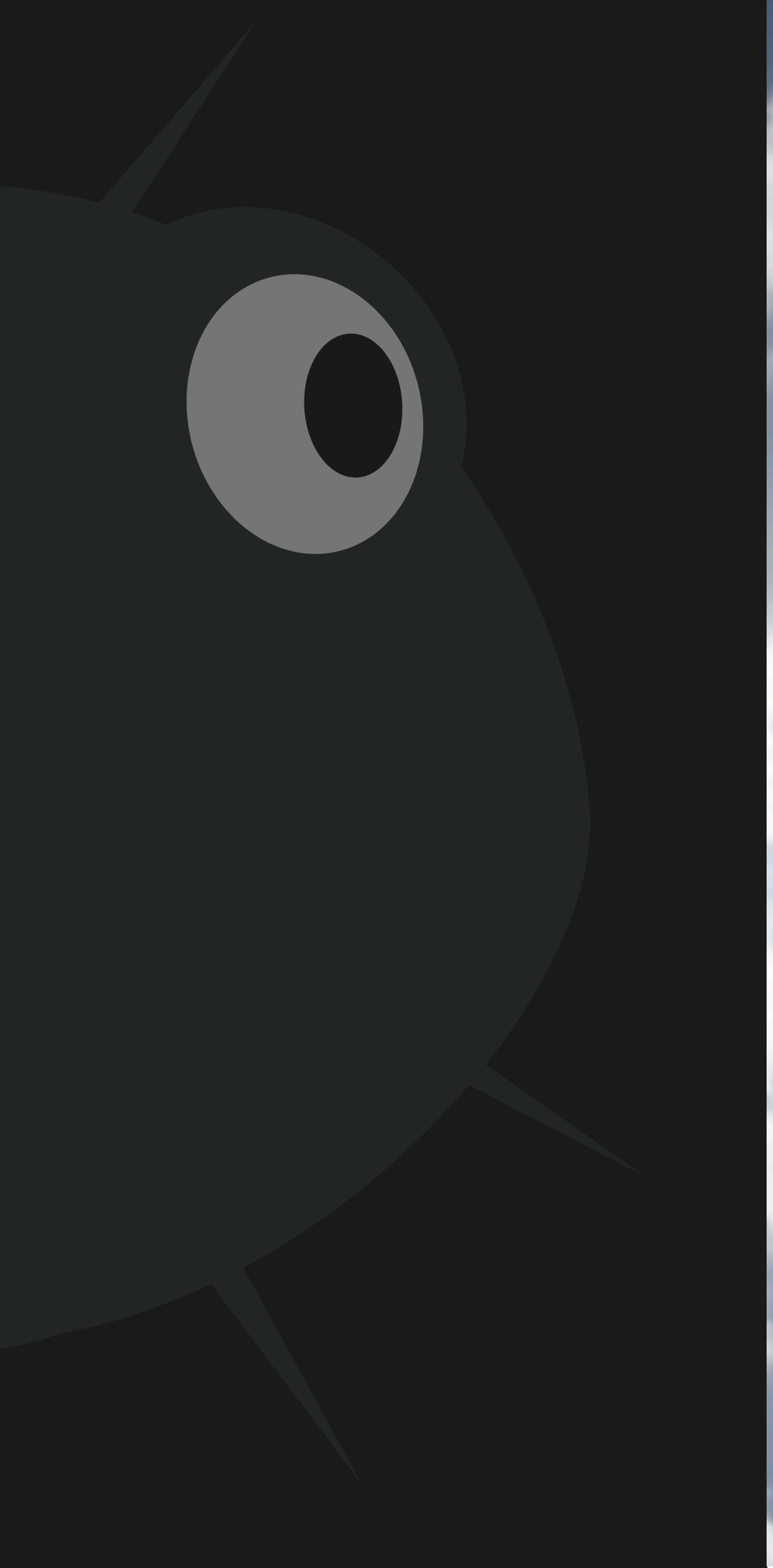


Introduction to Cloud Computing

Adam Skogman, Jayway

Photo by Mark Bonassera

Start-up?

JAYWAY

Overwhelmed?

JAYWAY

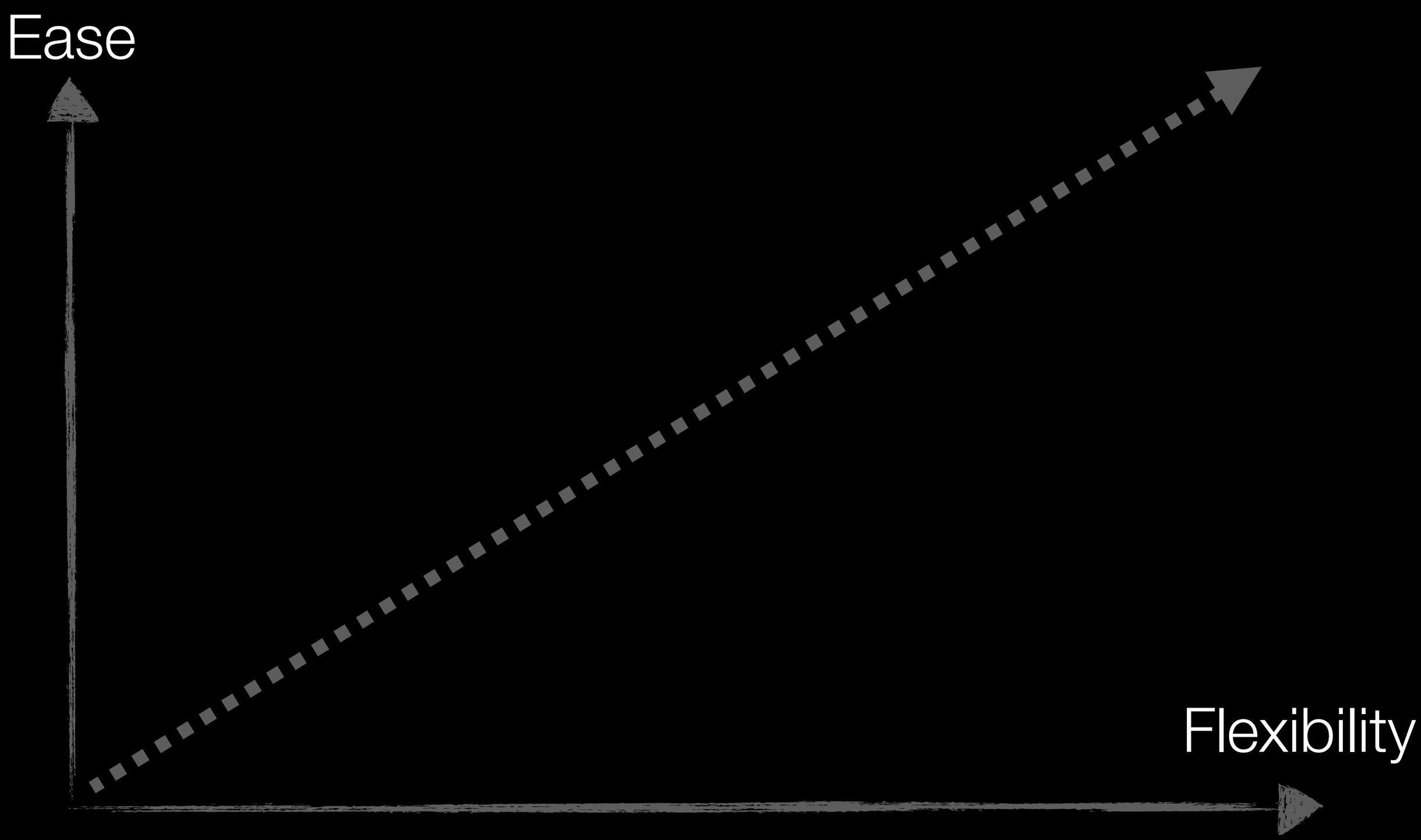
Successful?

JAYWAY

Waiting for IT?

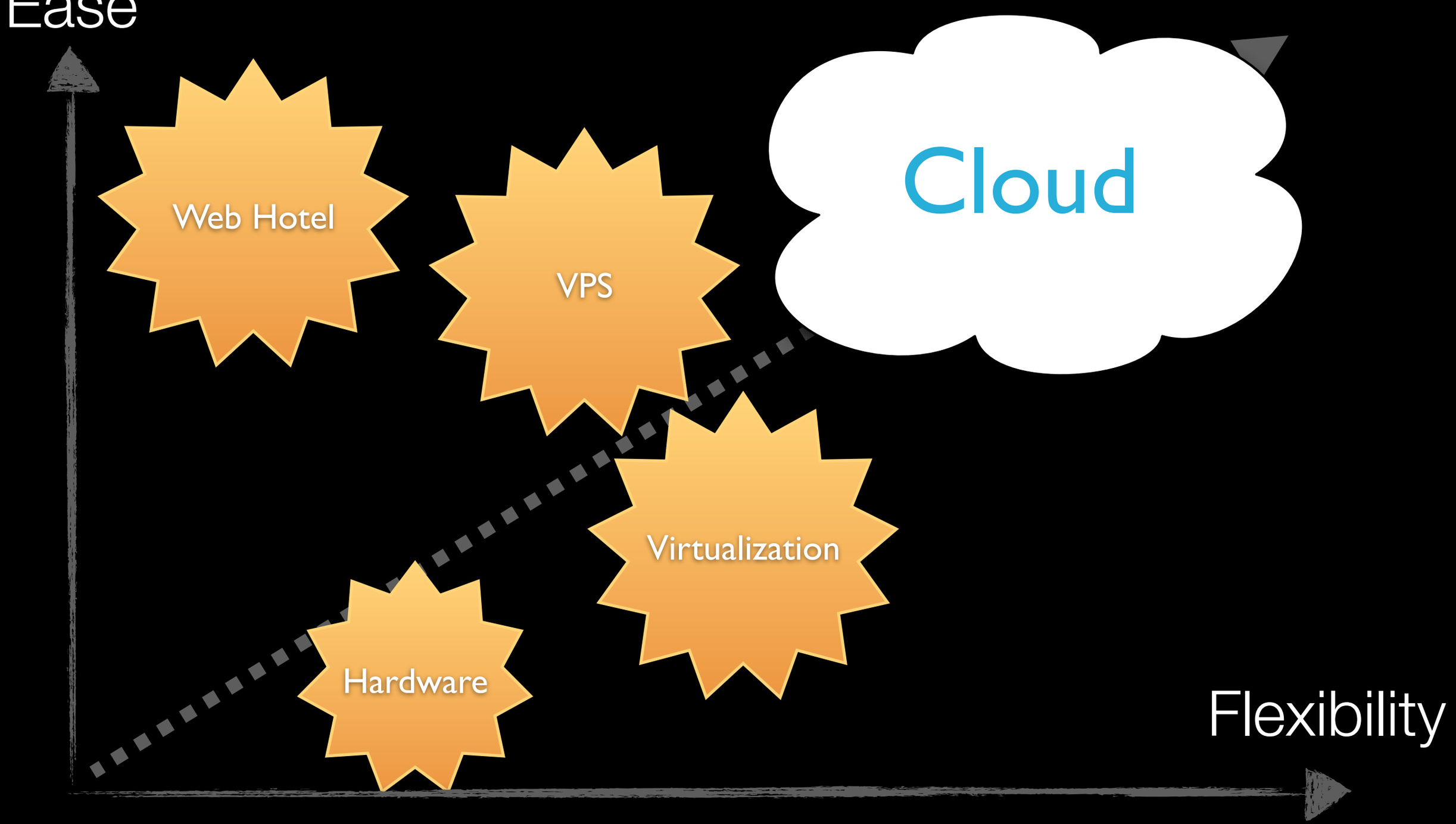
JAYWAY

Didn't We Solve This?

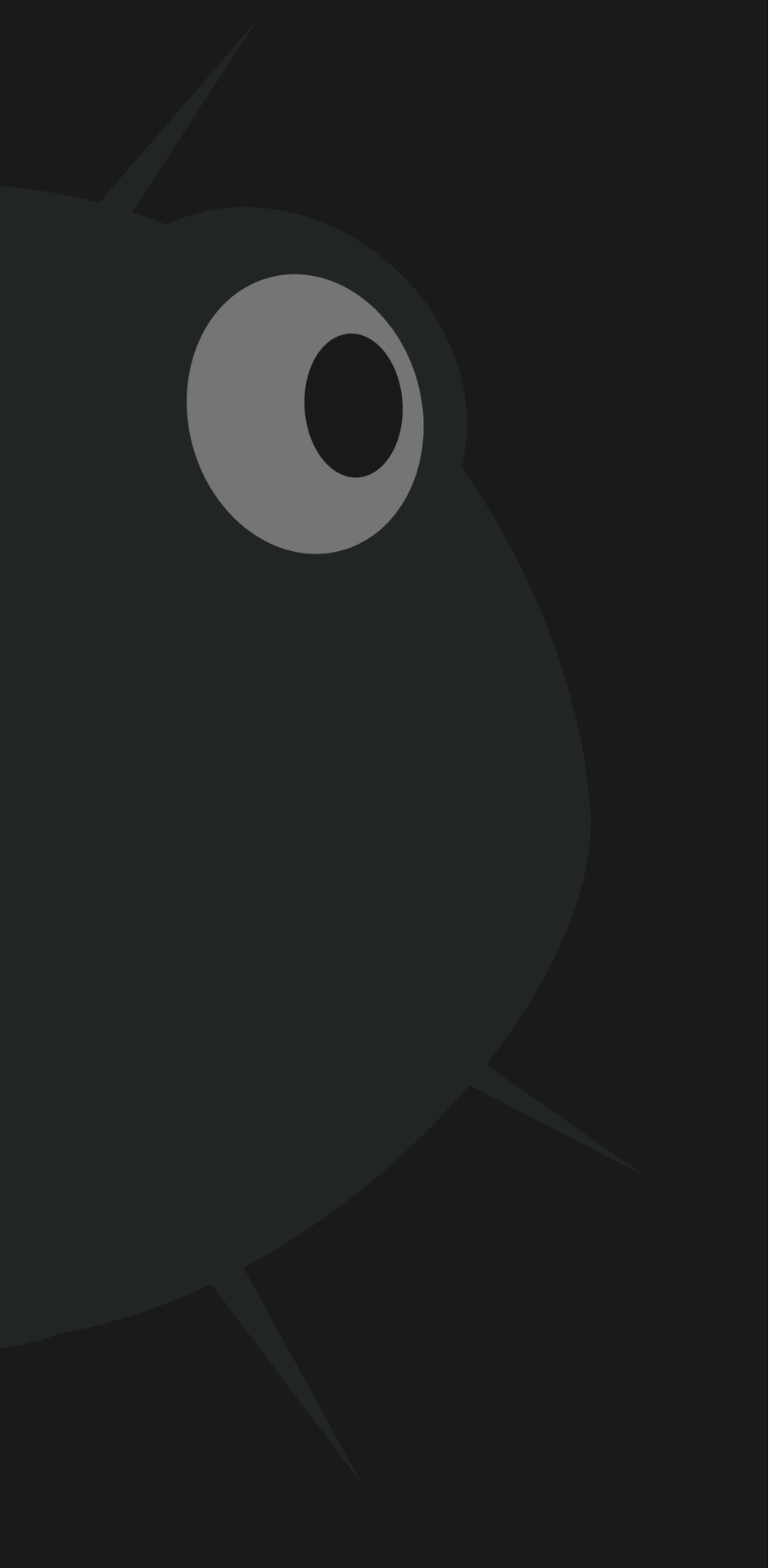


JAYWAY

Didn't We Solve This?



JAYWAY

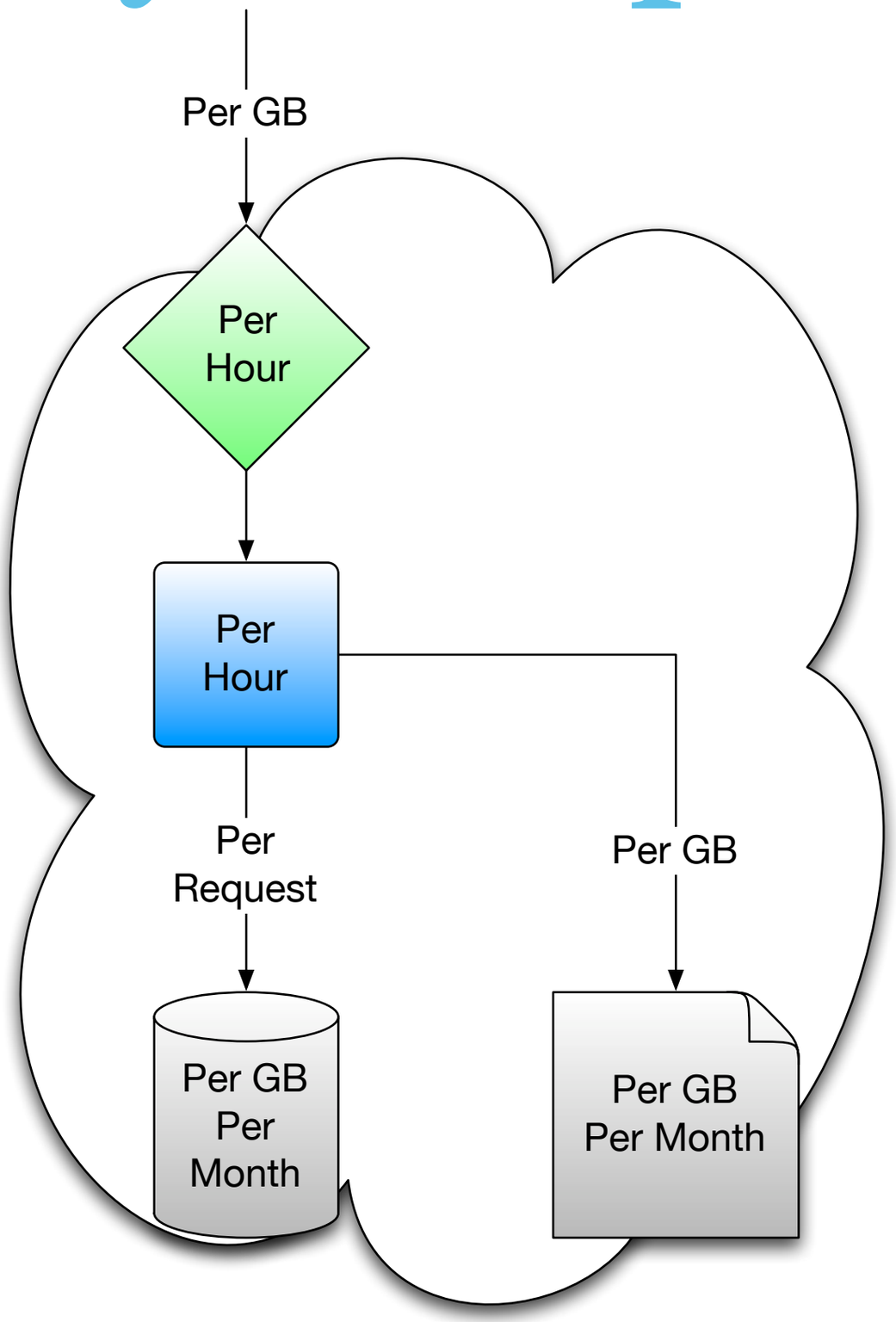


What is Cloud?

Cutting through the FUD

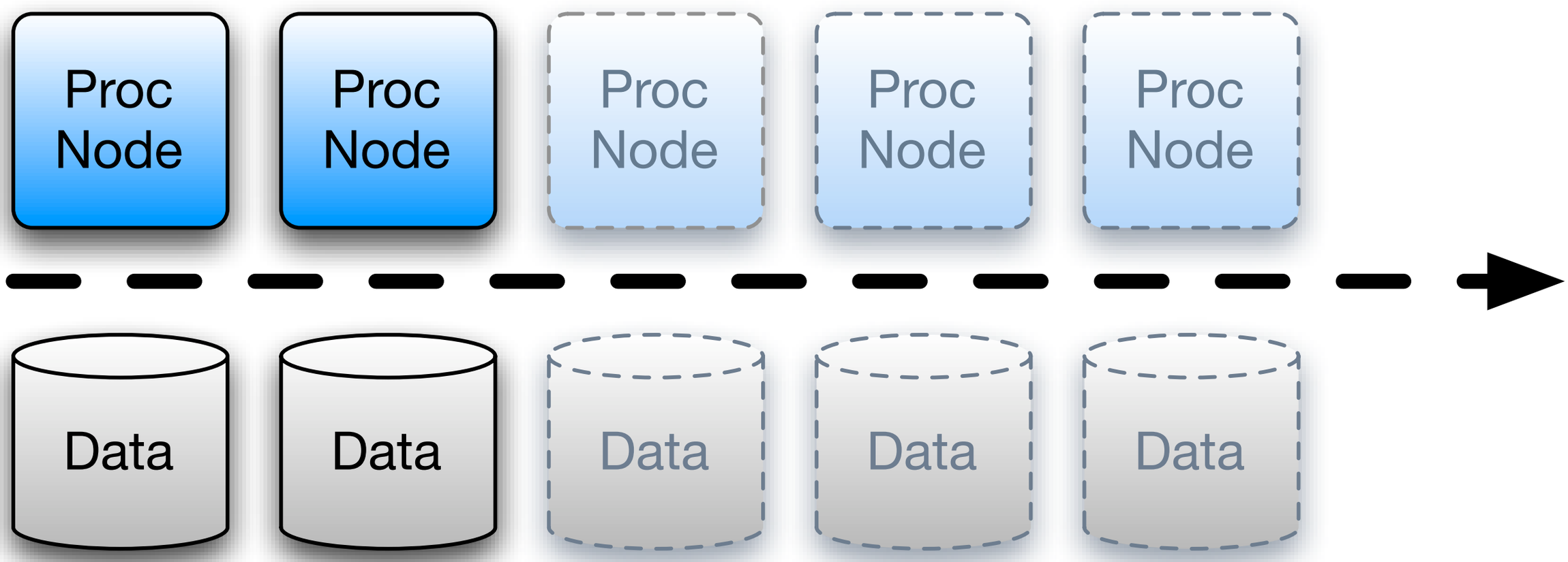
JAYWAY

Utility Computing



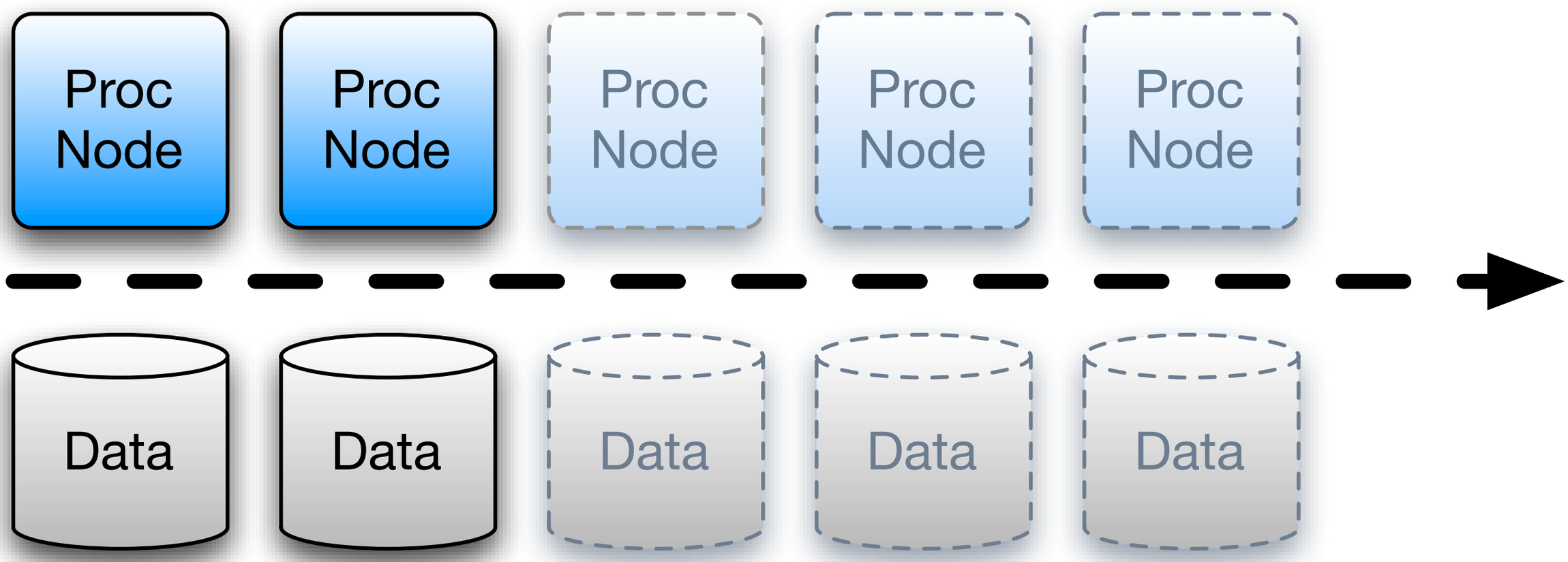
JAYWAY

On-Demand Capacity



JAYWAY

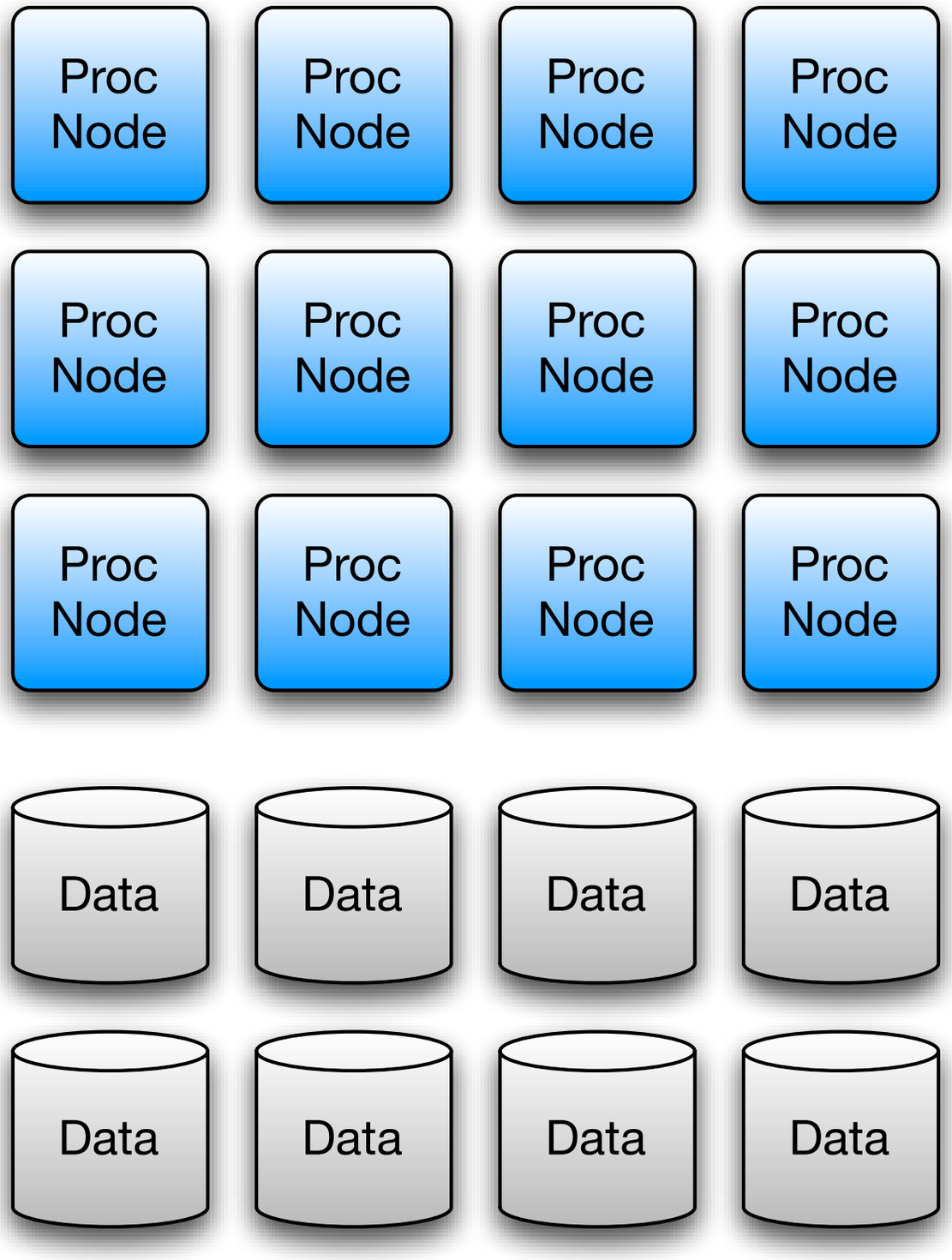
On-Demand Capacity



- API
- GUI

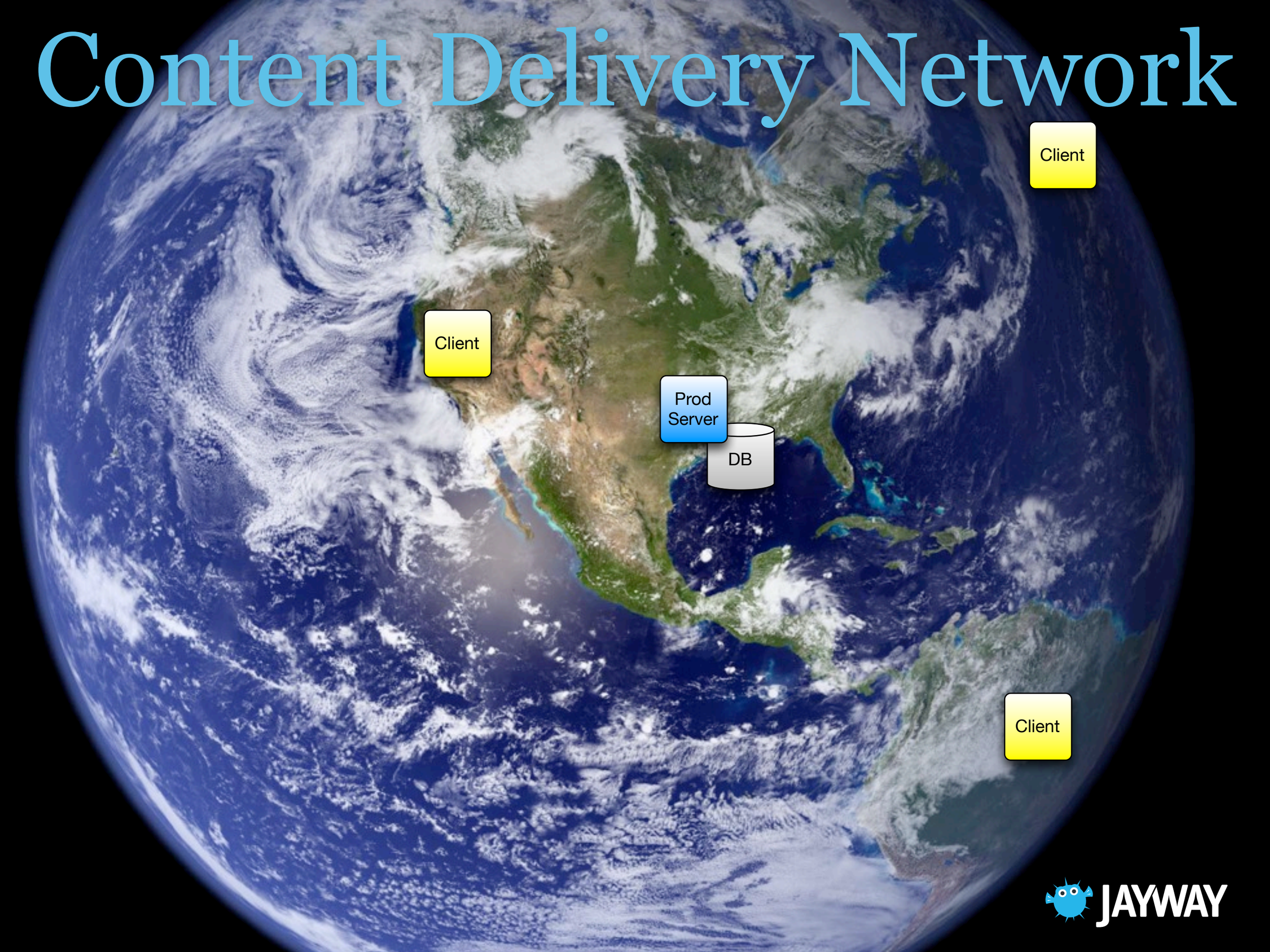
JAYWAY

Grid Computing



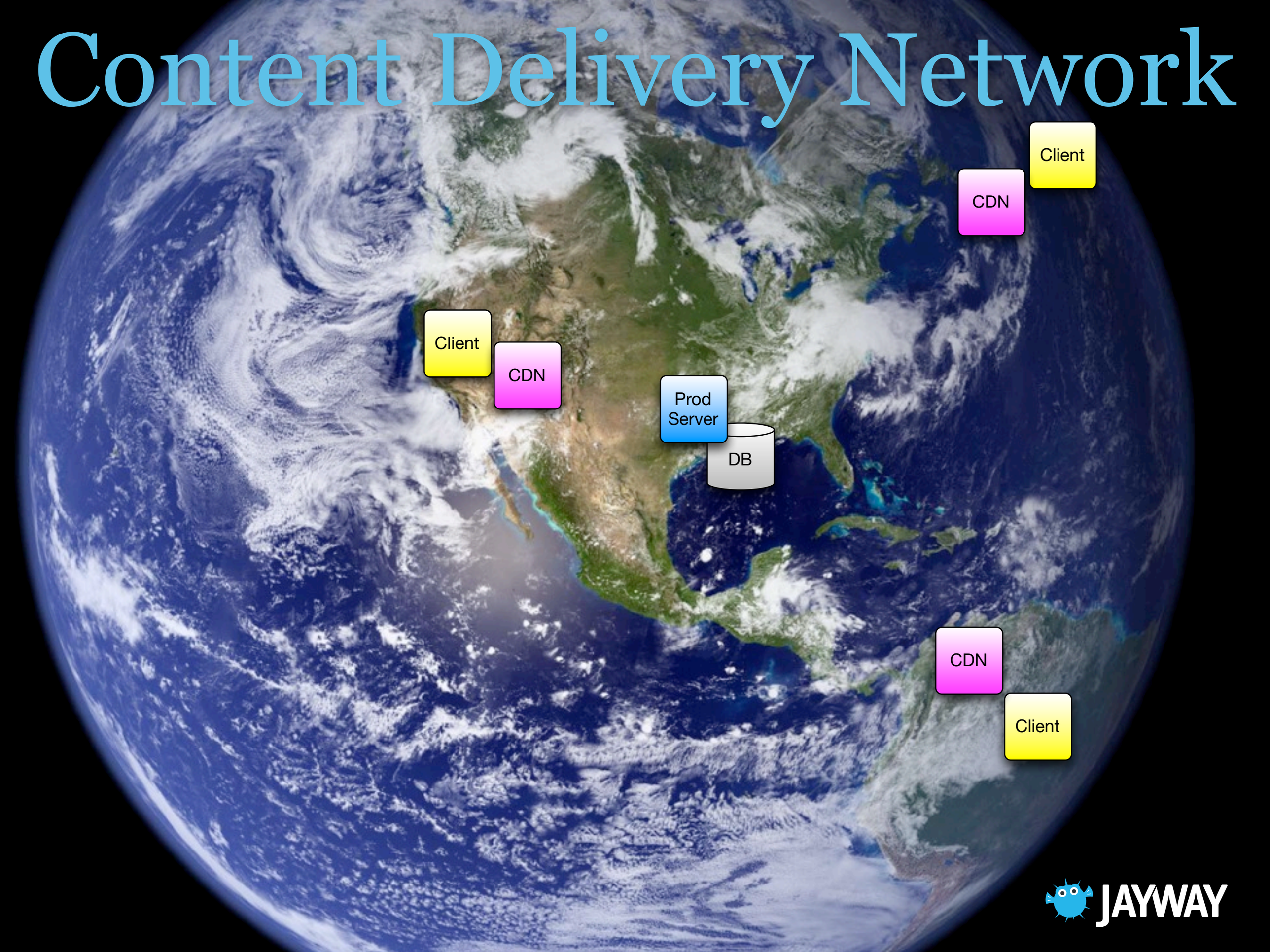
JAYWAY

Content Delivery Network



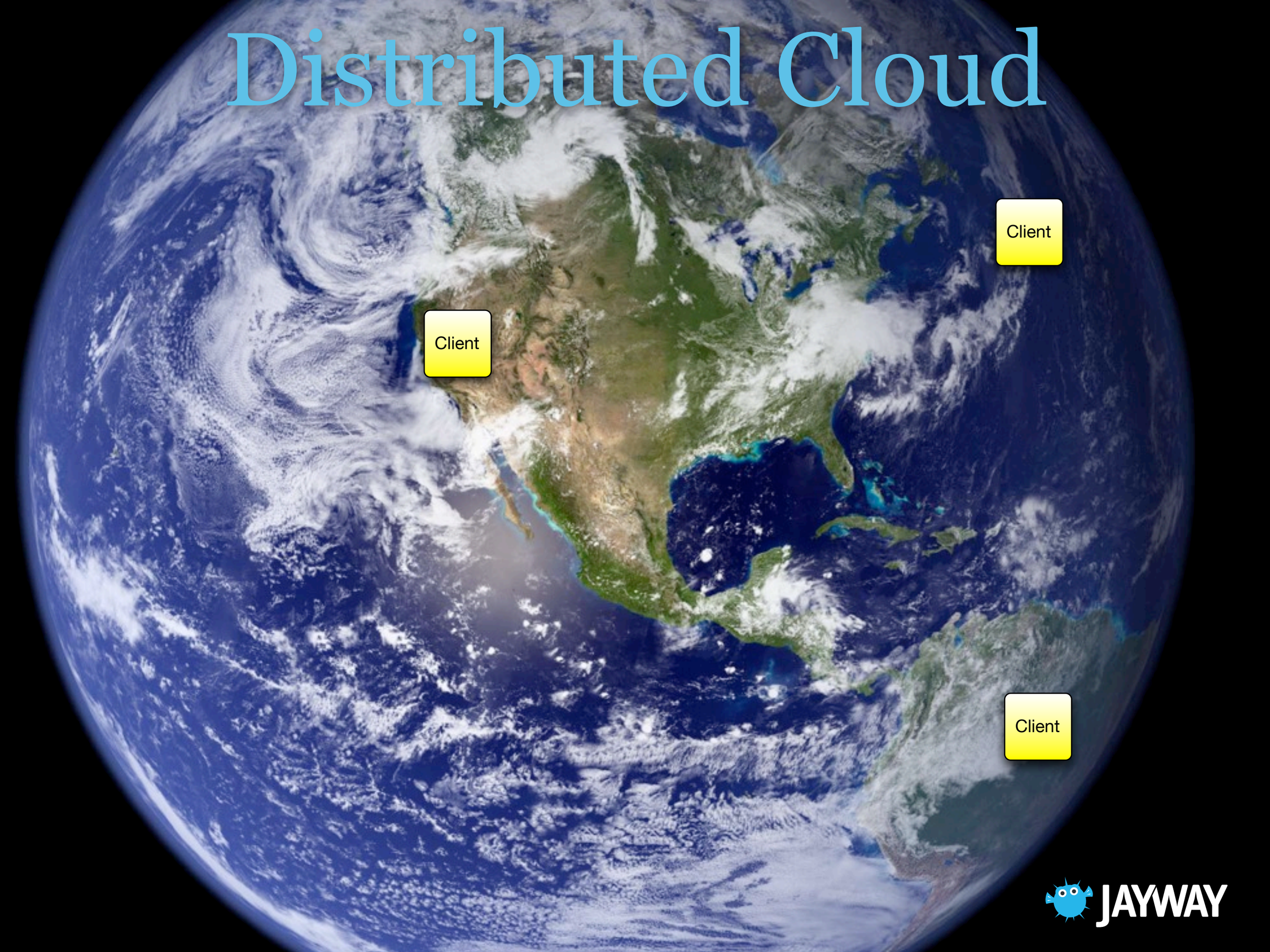
JAYWAY

Content Delivery Network



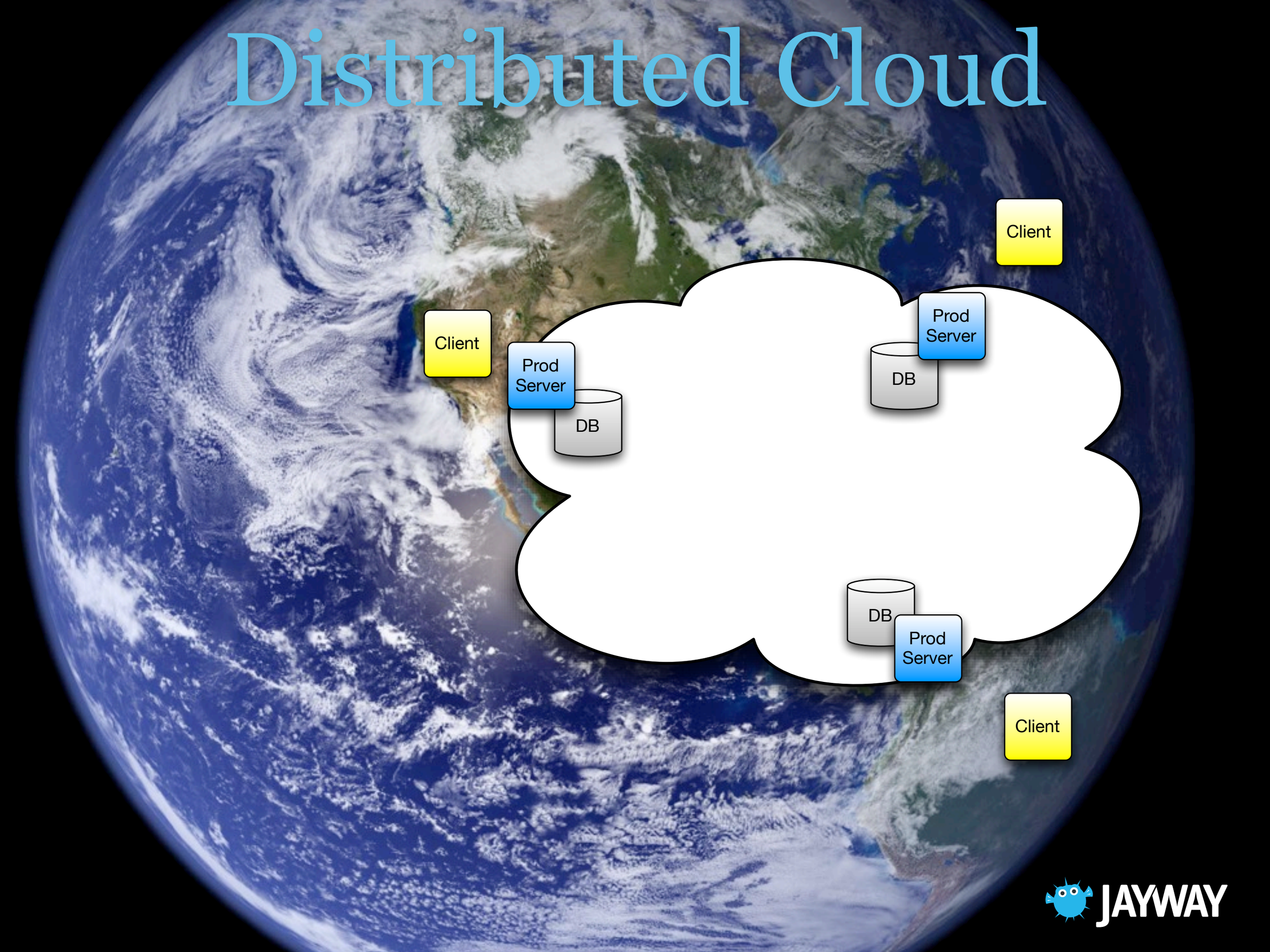
JAYWAY

Distributed Cloud



JAYWAY

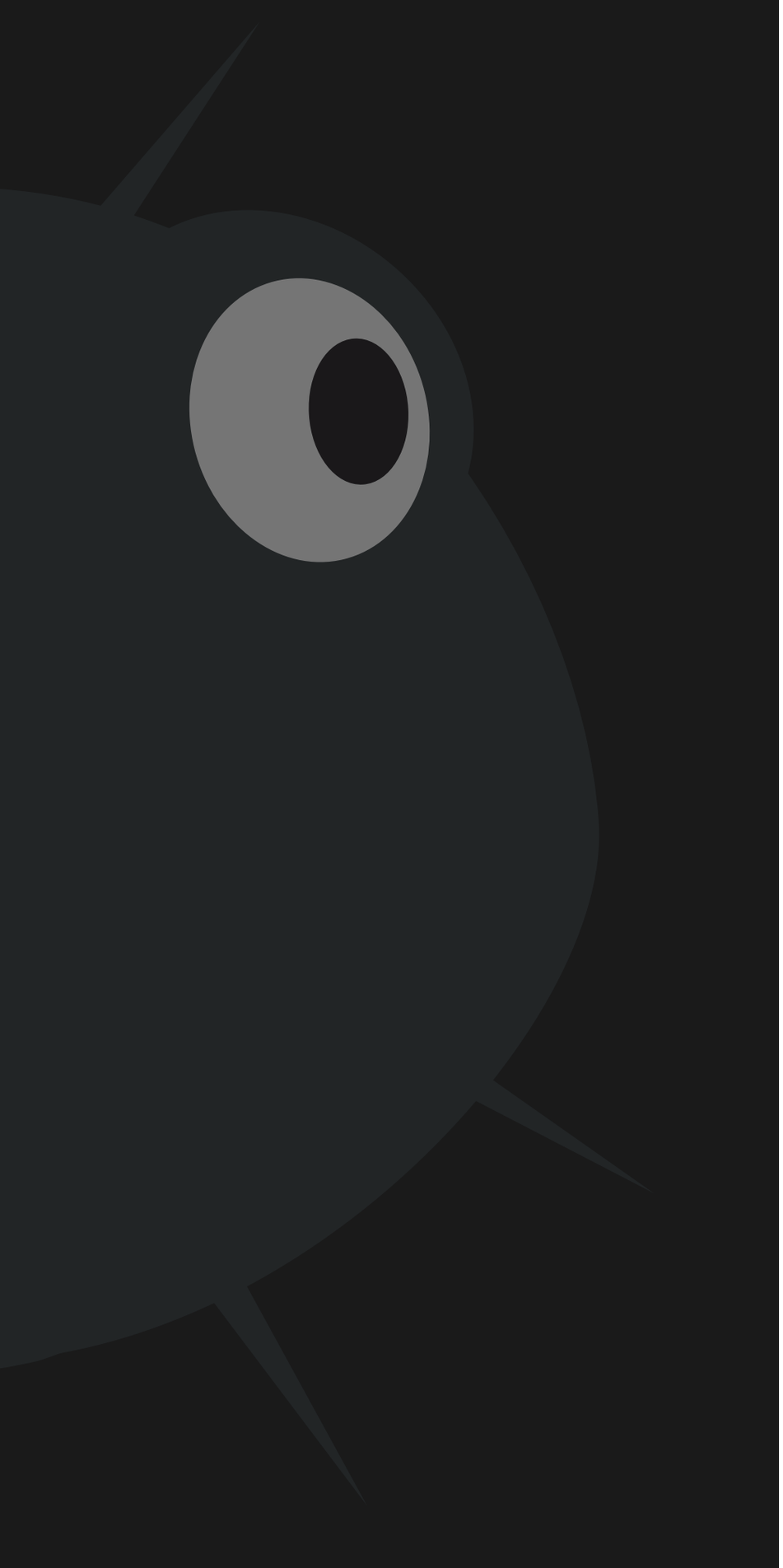
Distributed Cloud



JAYWAY

There are Lots of Clouds

IaaS PaaS SaaS



Amazon

Infrastructure as a Service

JAYWAY


Traffic
More...
Map
Satellite
Terrain
mi
km
©2009 Google - Imagery ©2009 TerraMetrics, NASA - Terms of Use

Bandwidth

- $0.10 / GB to Amazon
- $0.17 / GB from Amazon
- Free inside Amazon

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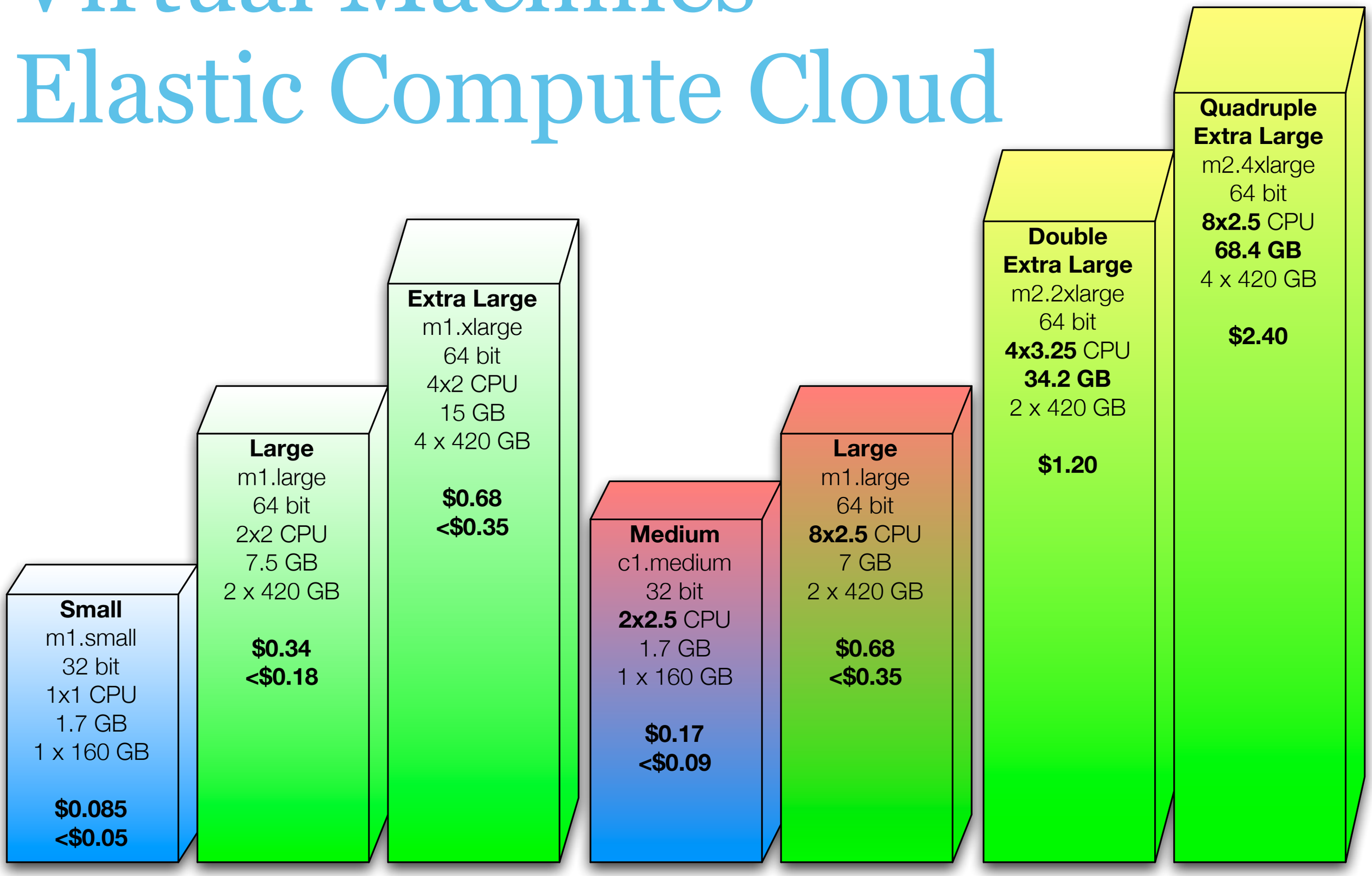
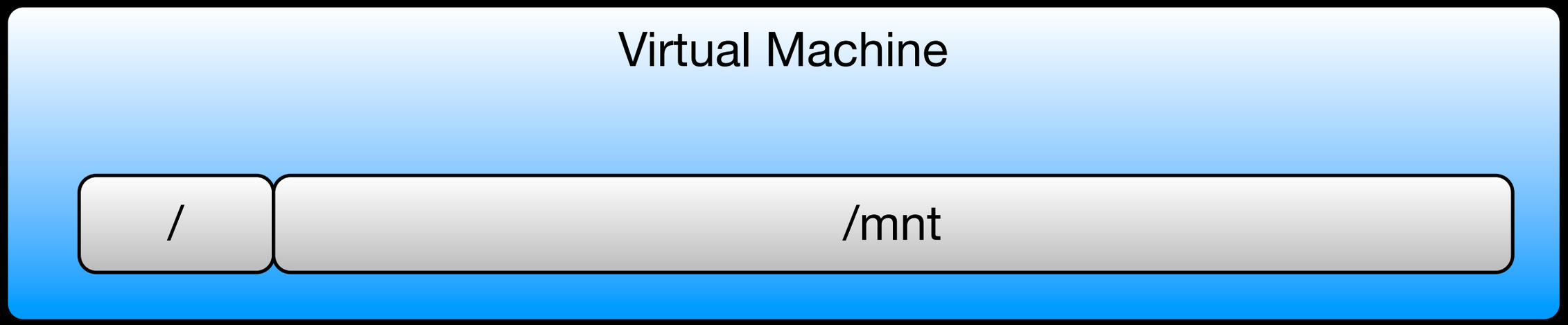
Virtual Machines
Elastic Compute Cloud

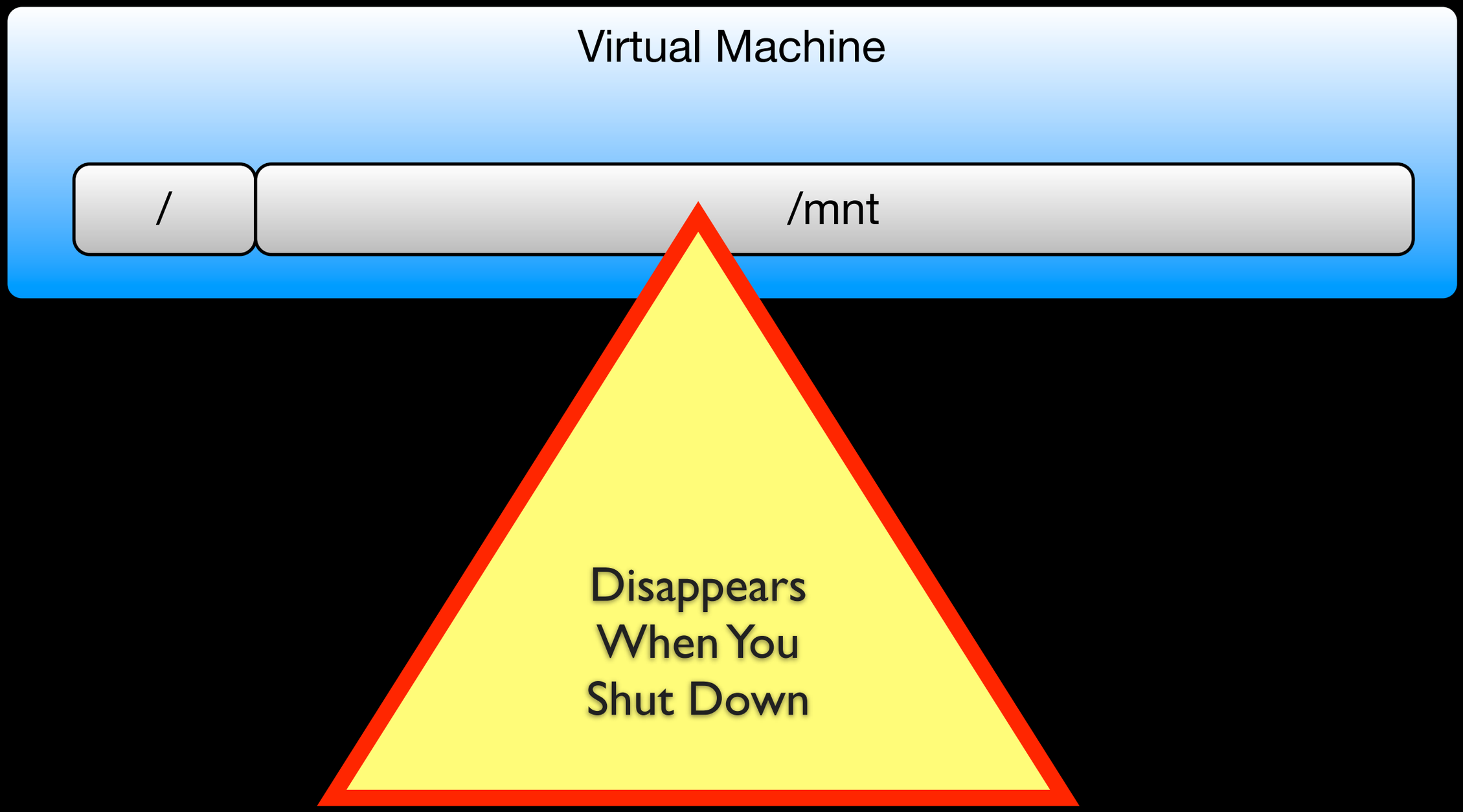


JAYWAY

Ephemeral Storage



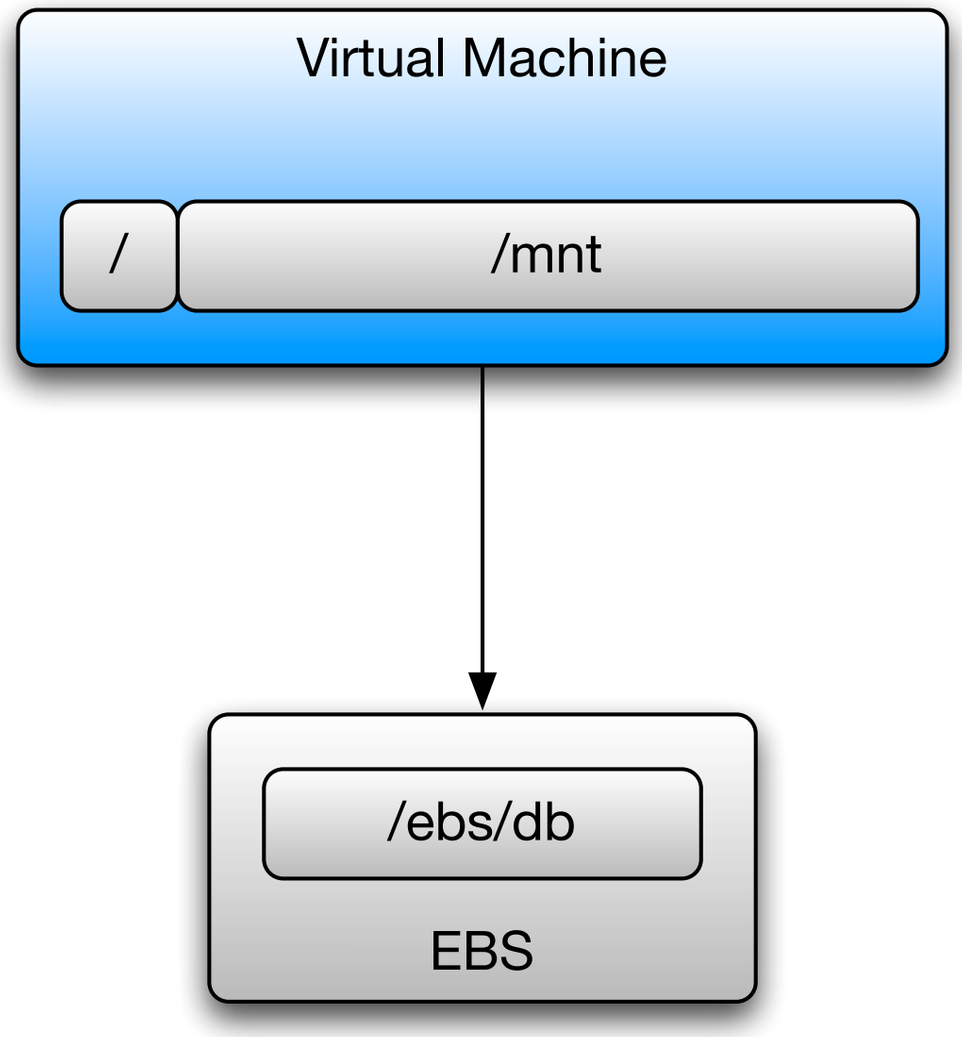
Ephemeral Storage



JAYWAY

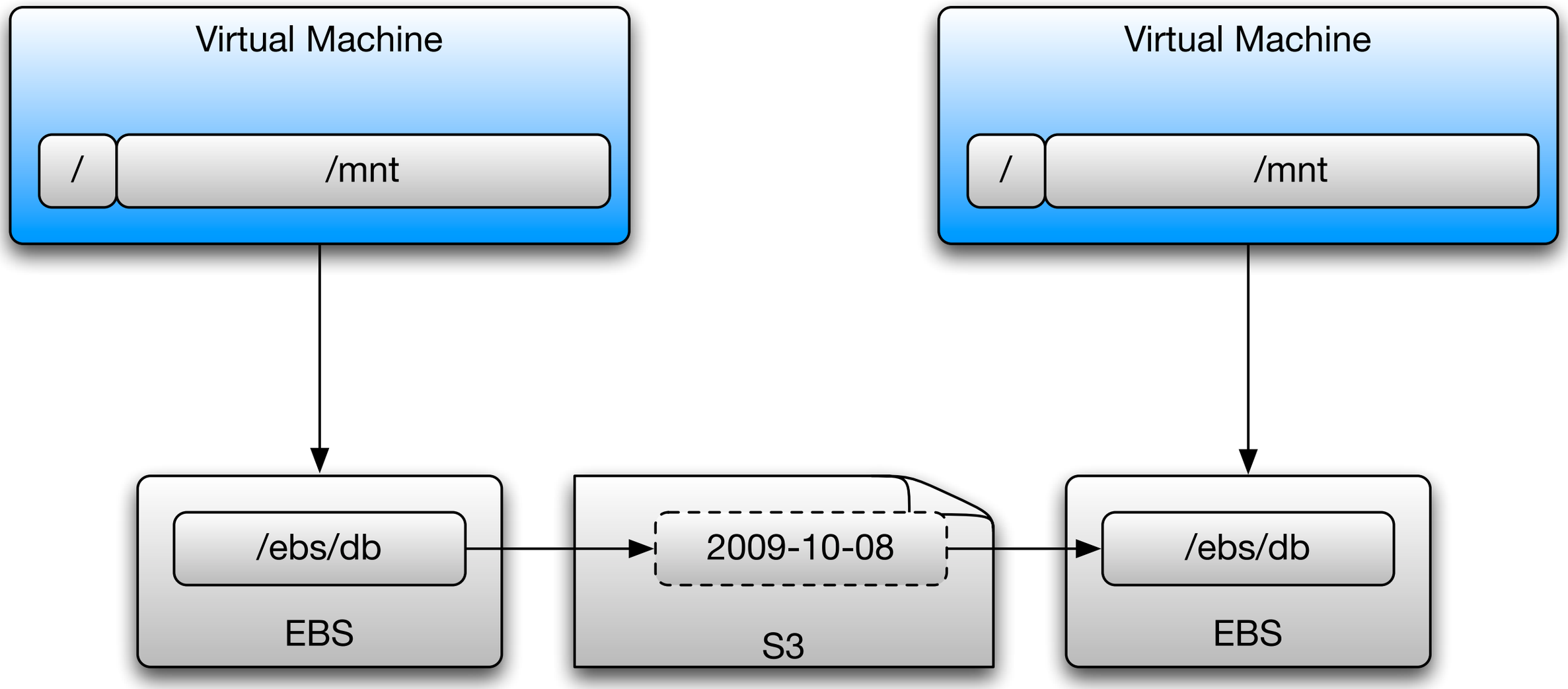
Block Storage

- Amazon Elastic Block Storage (EBS)
- RAIDed!
  - Database files
  - Private data
- Price Model
  - $0.10 per GB provisioned / Month
  - $0.10 Per 1 Million Request

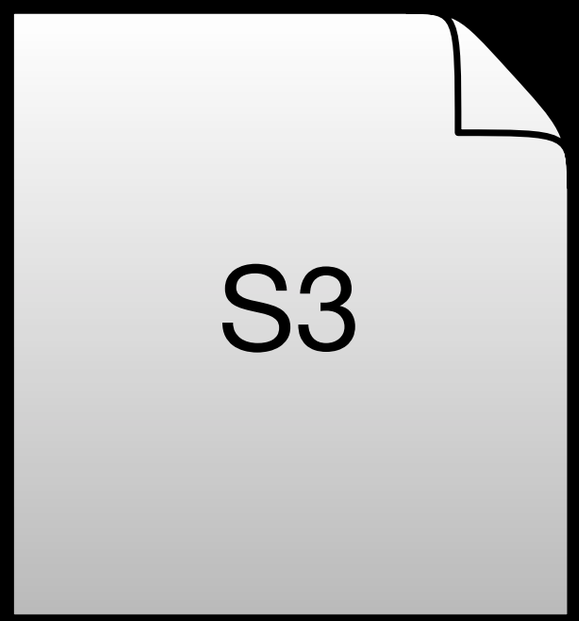


JAYWAY

Snapshots and Cloning

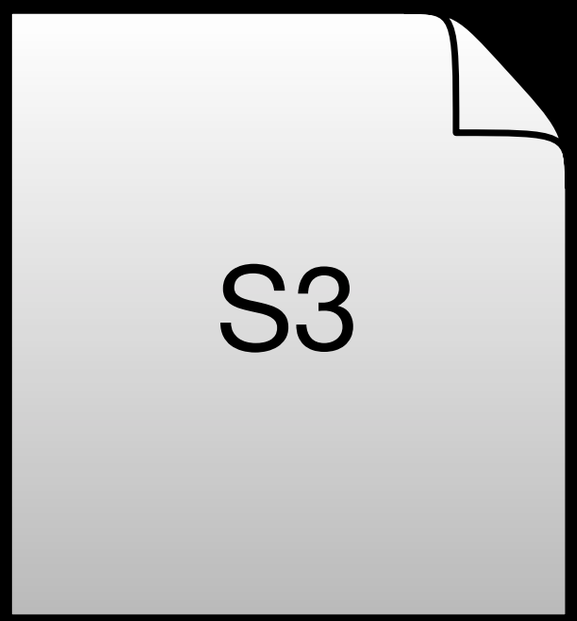


File Storage



File Storage

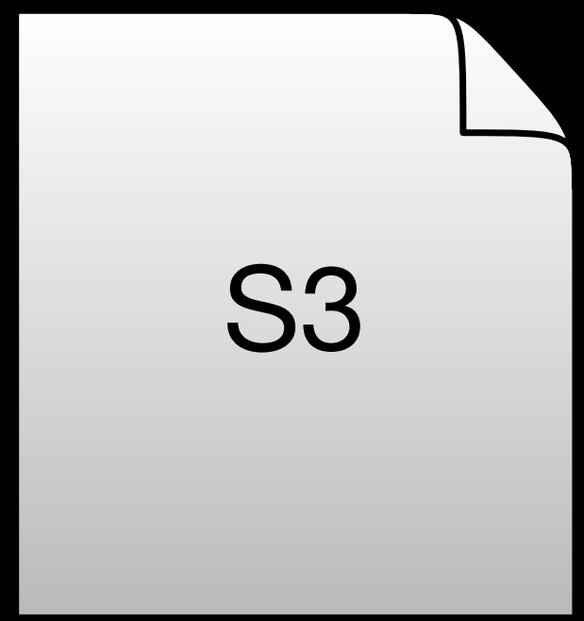
- Amazon Simple Storage Service (**S3**)



JAYWAY

File Storage

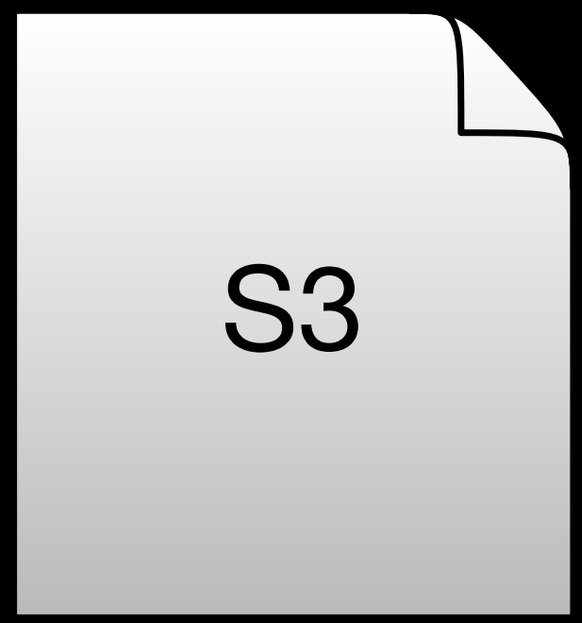
- Amazon Simple Storage Service (**S3**)
- Unlimited **Redundant** Storage



JAYWAY

File Storage

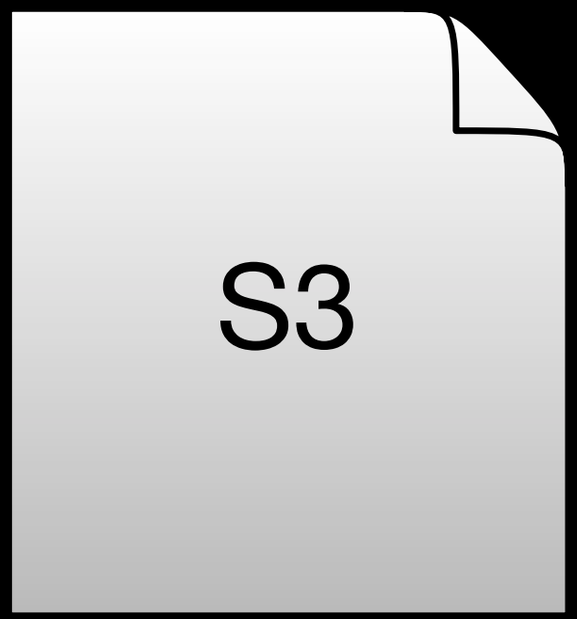
- Amazon Simple Storage Service (**S3**)
- Unlimited **Redundant** Storage
- REST API / HTTP



JAYWAY

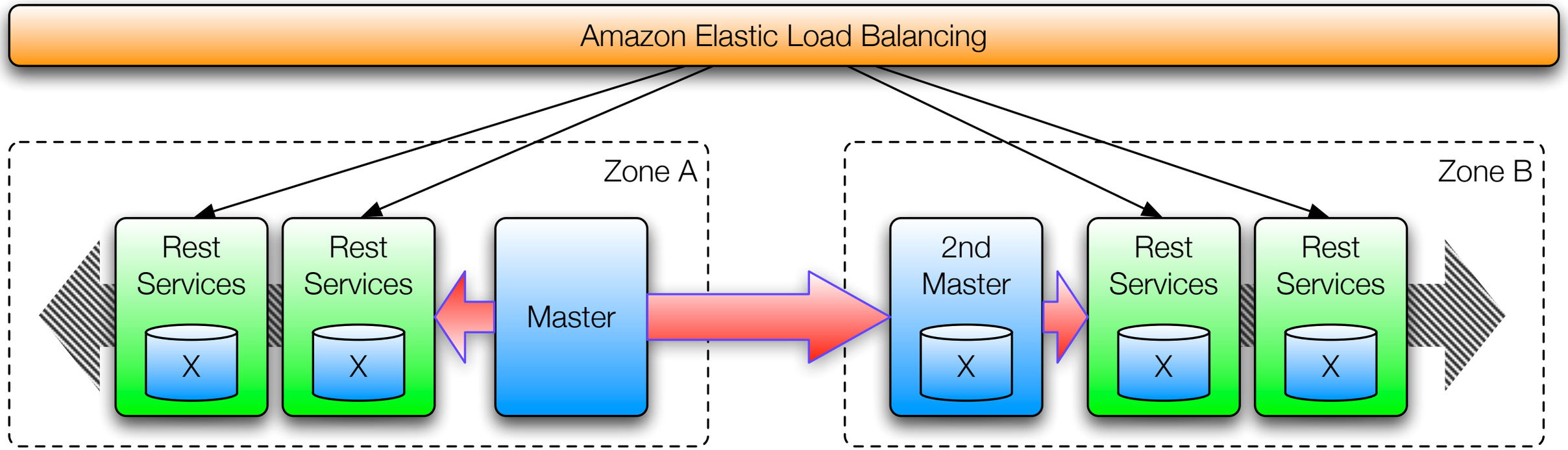
File Storage

- Amazon Simple Storage Service (**S3**)
- Unlimited **Redundant** Storage
- REST API / HTTP
- Price Model (not complete)
  - $0.15 per GB and Month (first 50 TB)
  - $0.17 per GB transferred out (first 10 TB)
  - $0.01 Per 1000 Write Requests



JAYWAY

Scaling Out with Redundancy



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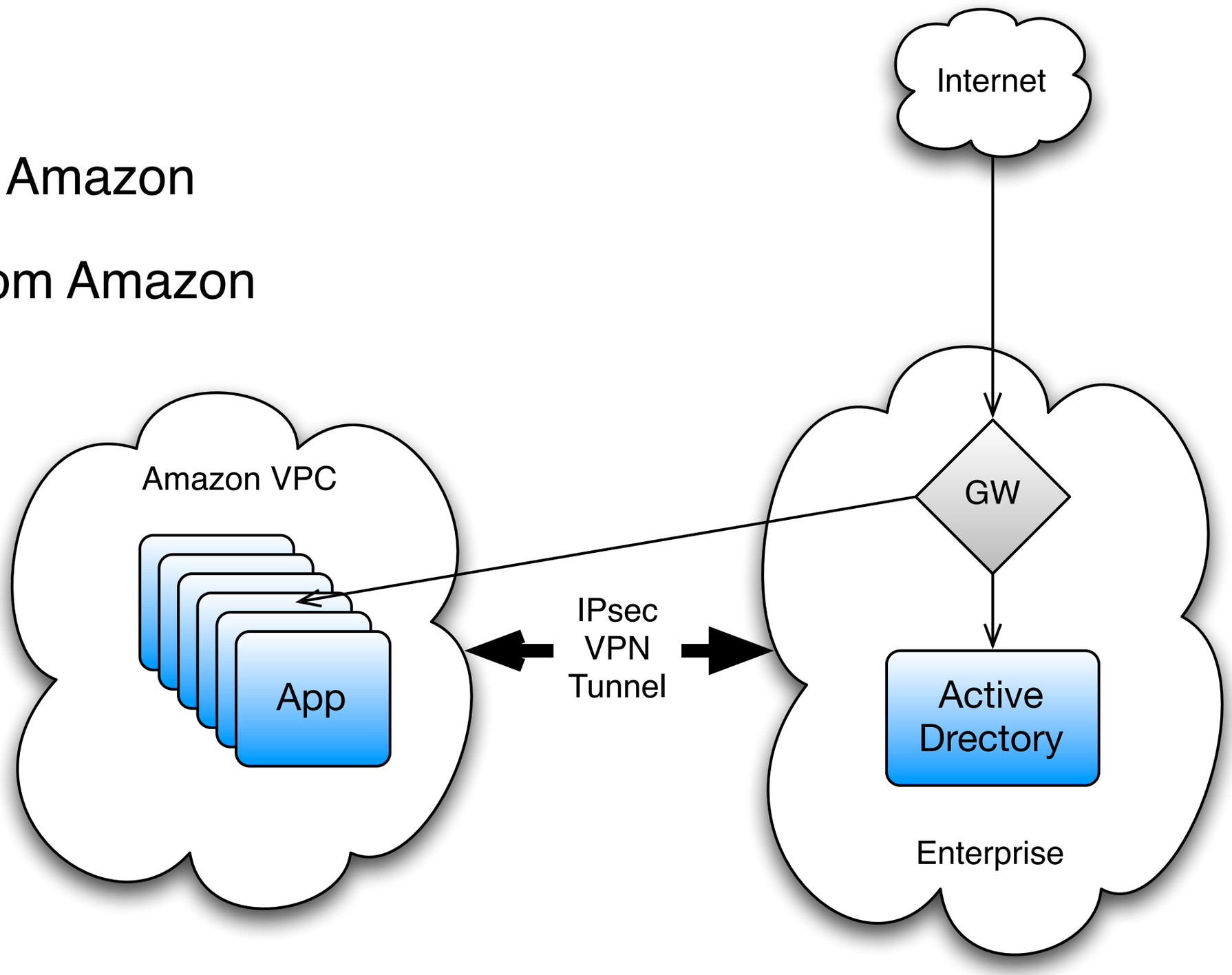
Virtual Private Cloud

- $0.05 / hour
- $0.10 / GB to Amazon
- $0.17 / GB from Amazon



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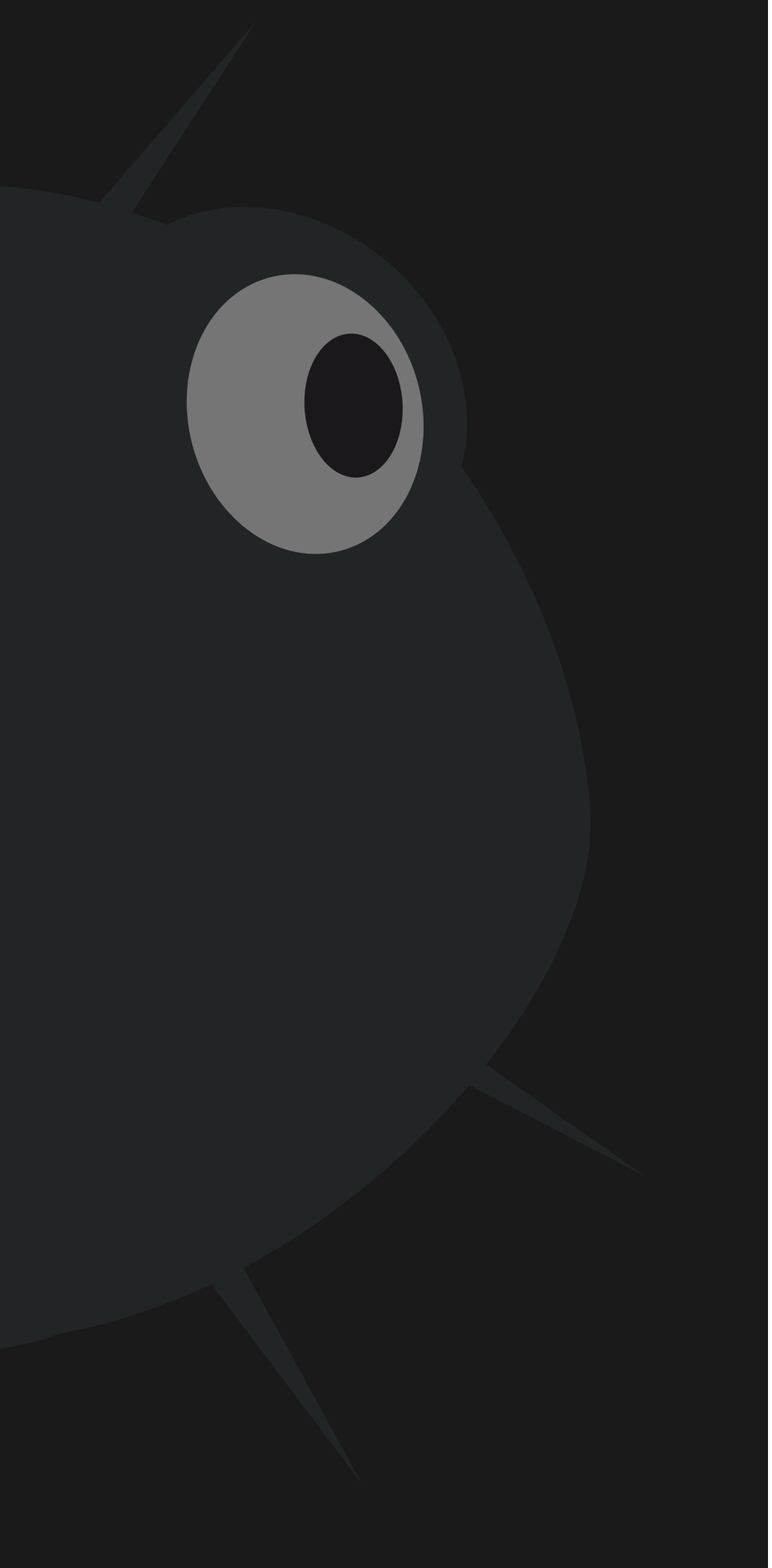
Cloud Front

- Serve static content close to user
- Major cities in US, EU, Asia
  - Amsterdam, Dublin, Frankfurt, London
- Serves from S3 Bucket
- Single domain name for all caches: foo123.cloudfront.net
- 1 GB/s, 1000 requests/s

JAYWAY

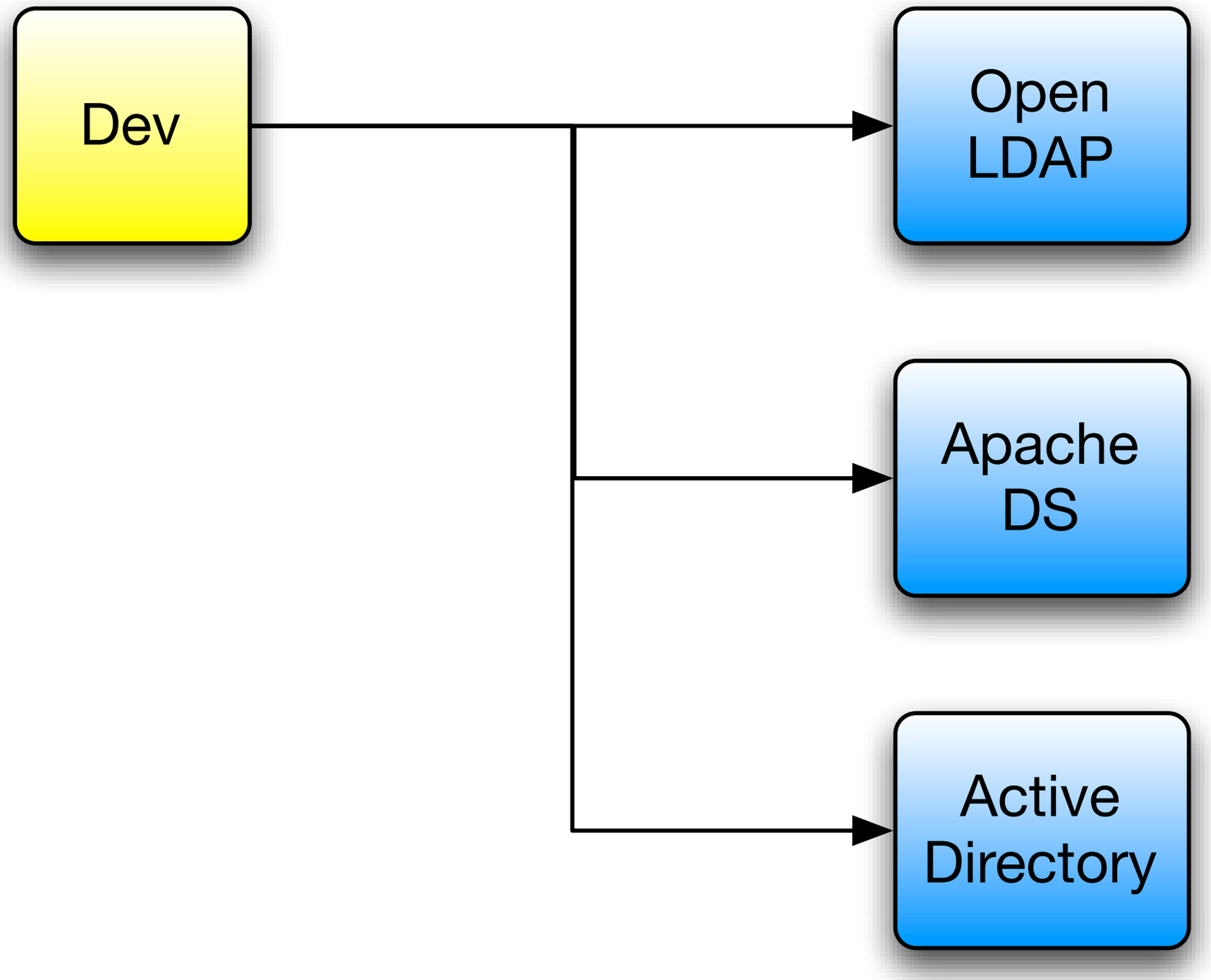


My First Clouds

Classic Architecture

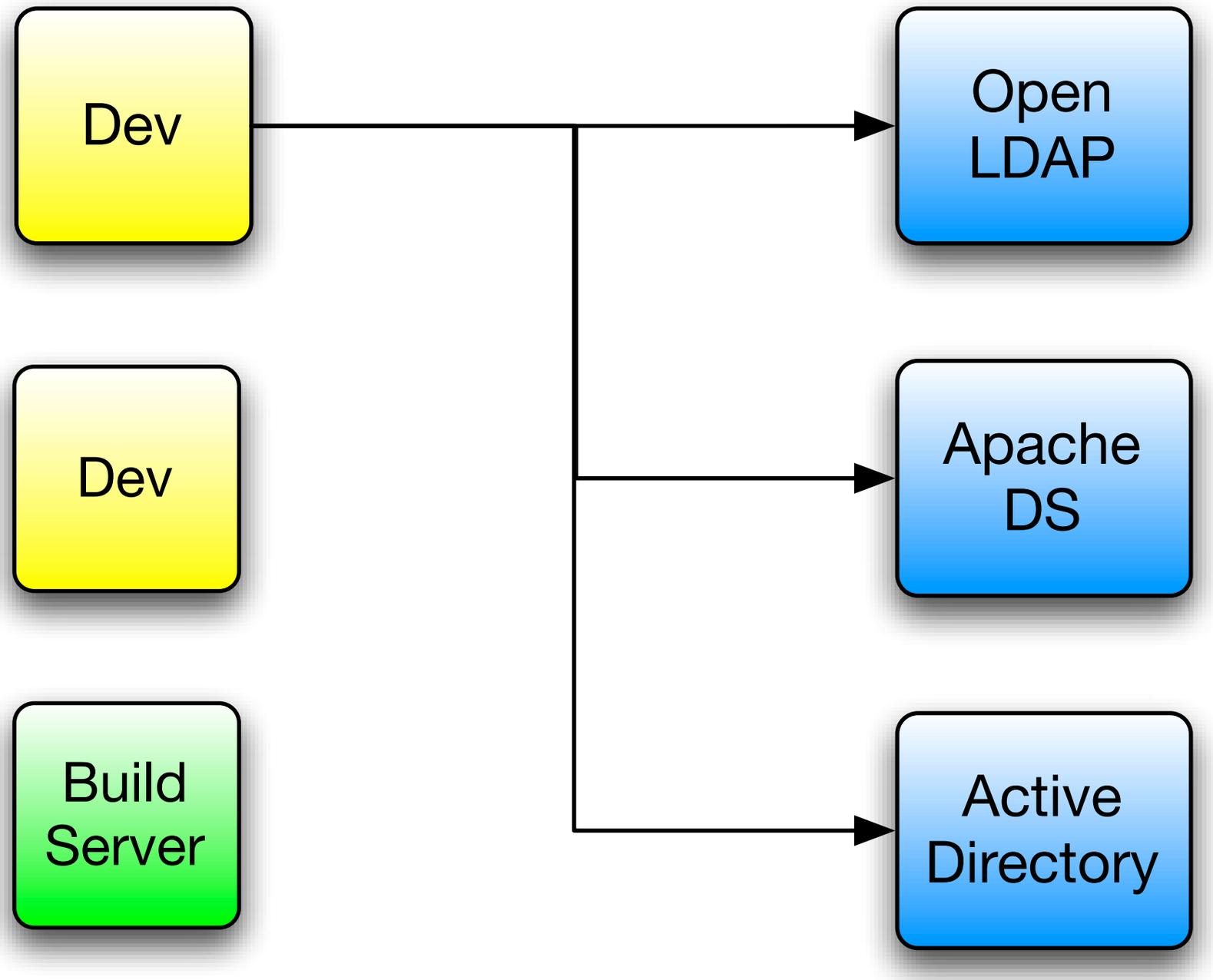
JAYWAY

Spring LDAP



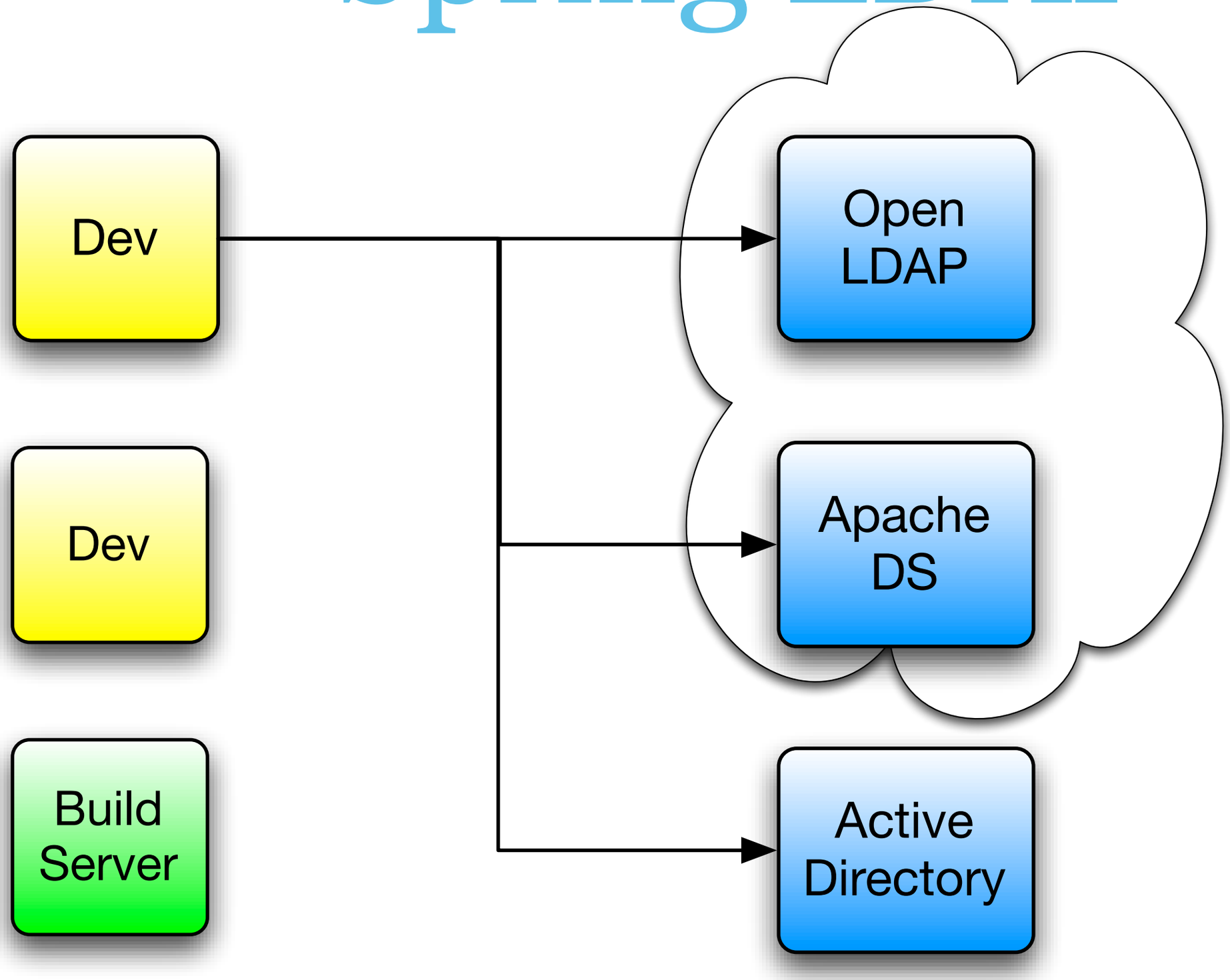
JAYWAY

Spring LDAP



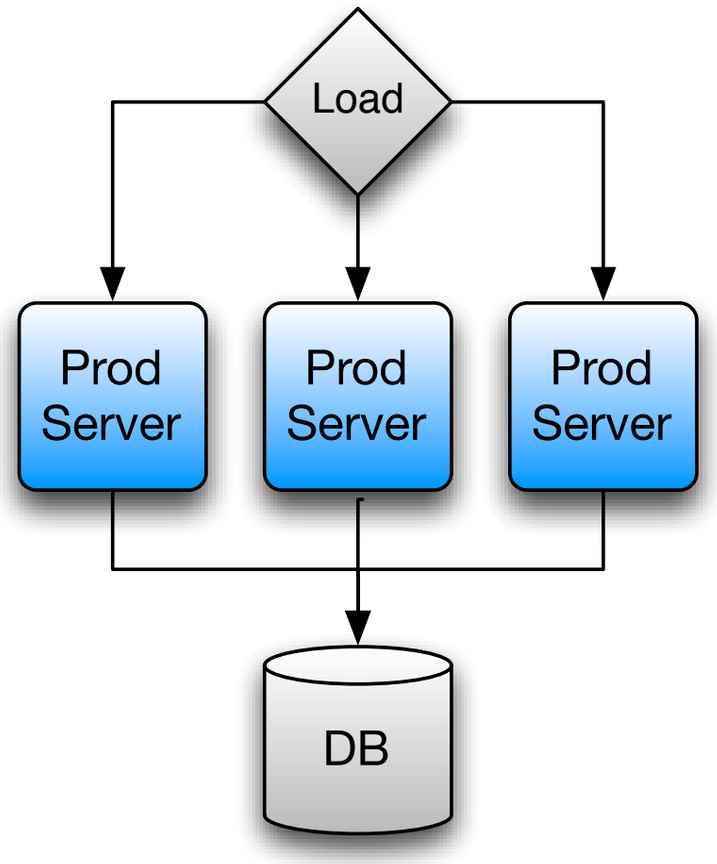
JAYWAY

Spring LDAP



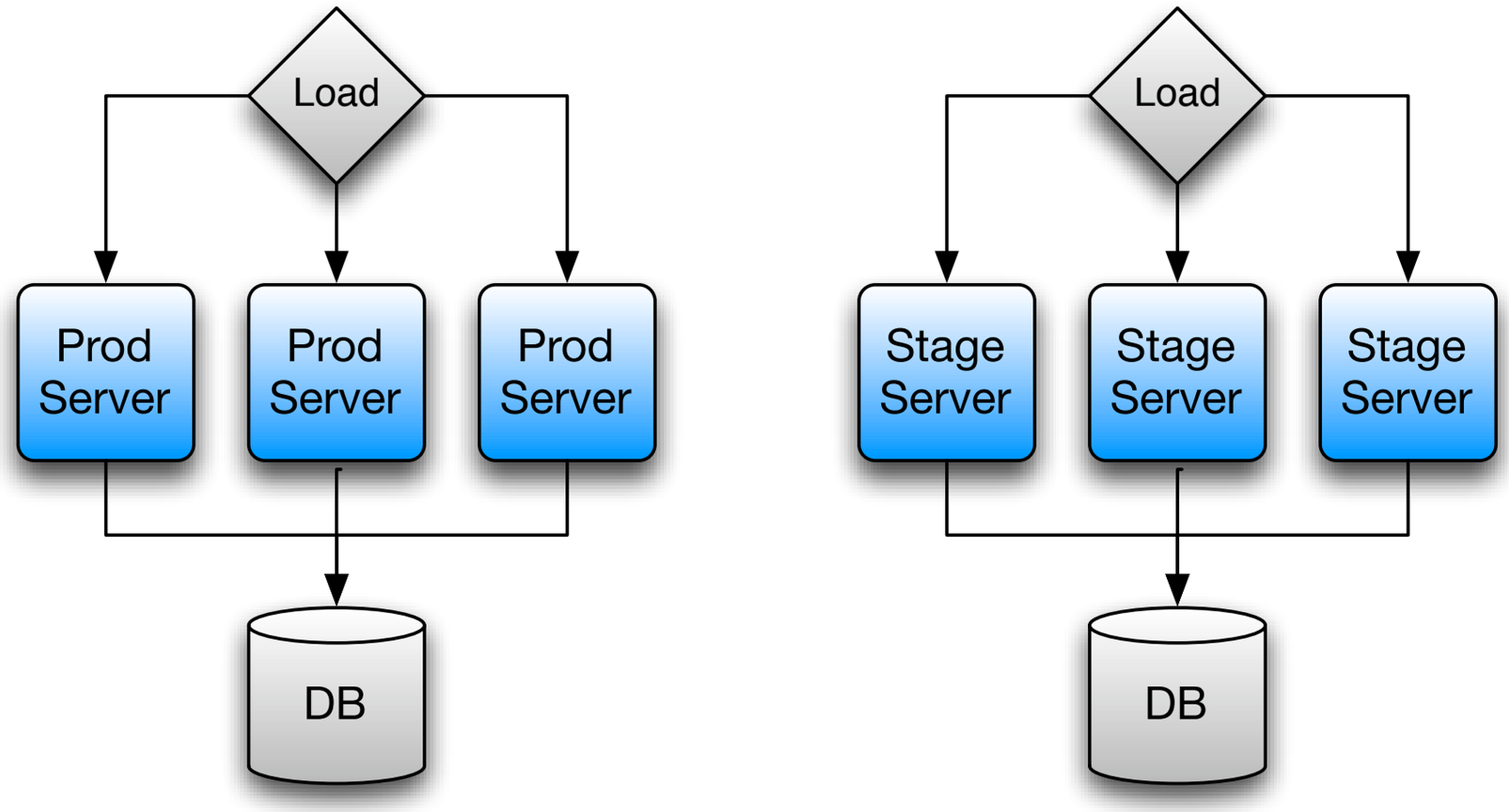
JAYWAY

Web Start-Up Company



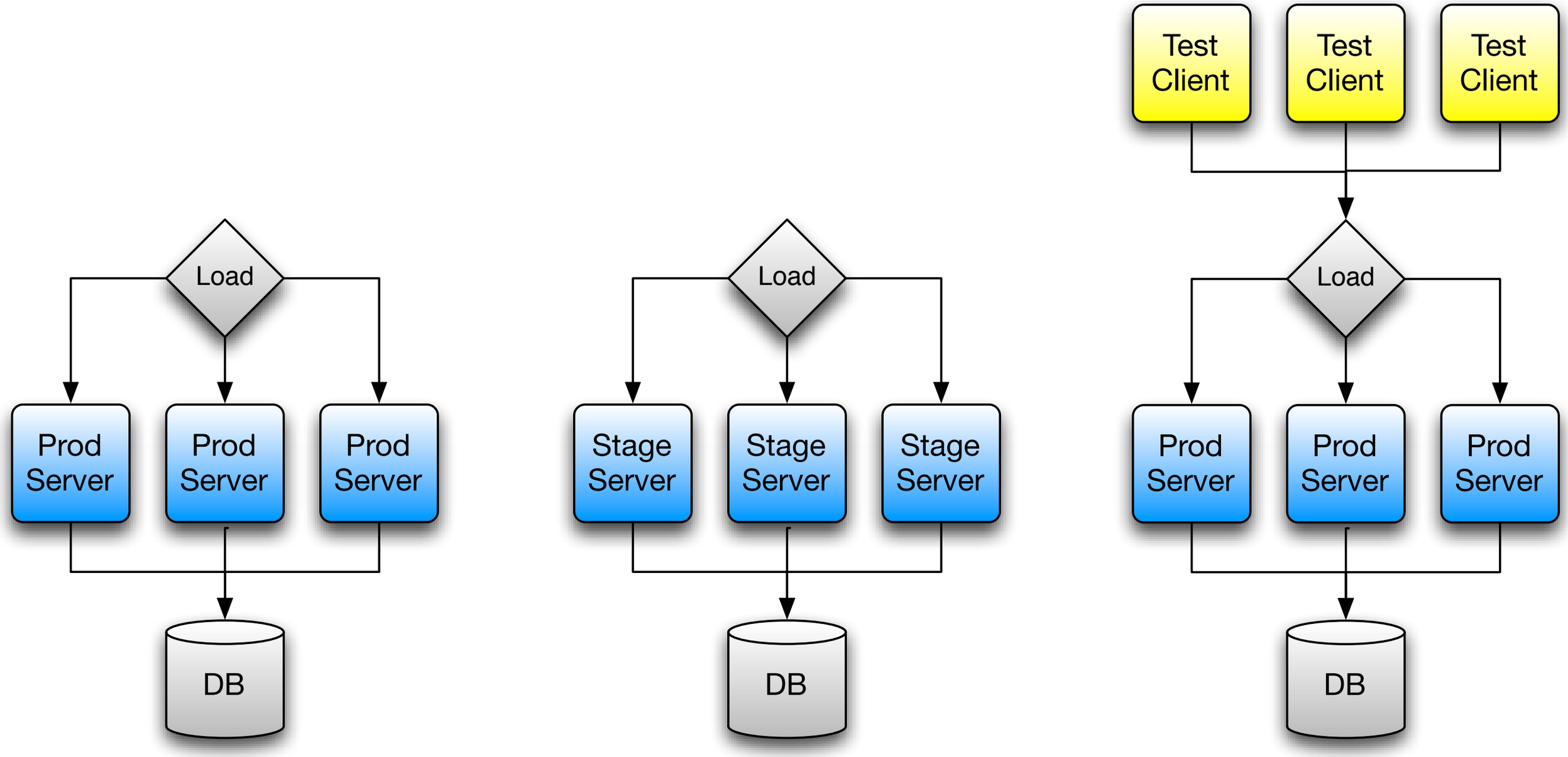
JAYWAY

Web Start-Up Company



JAYWAY

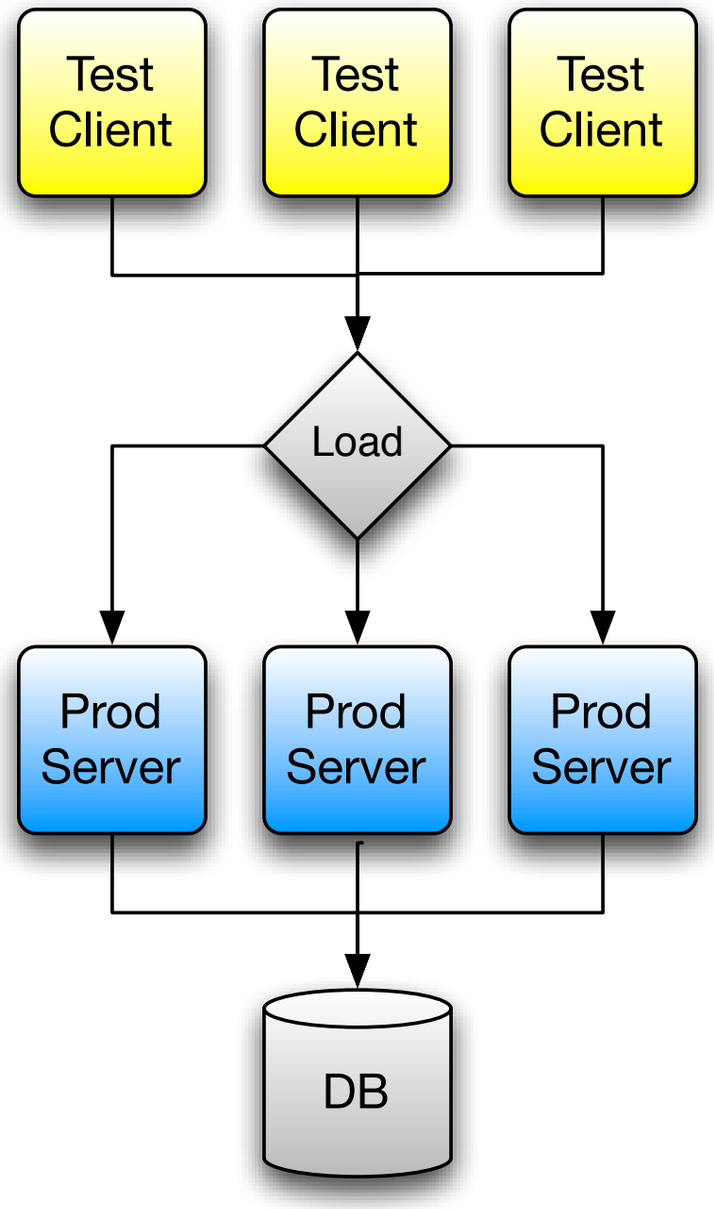
Web Start-Up Company



JAYWAY

Load-Test Business Case

- Physical/virtual
  - 8 servers
  - >8000 SEK / month
- Cloud
  - 2 hours / night
  - 20 nights / month
  - $2.50 per night
  - 700 SEK / month

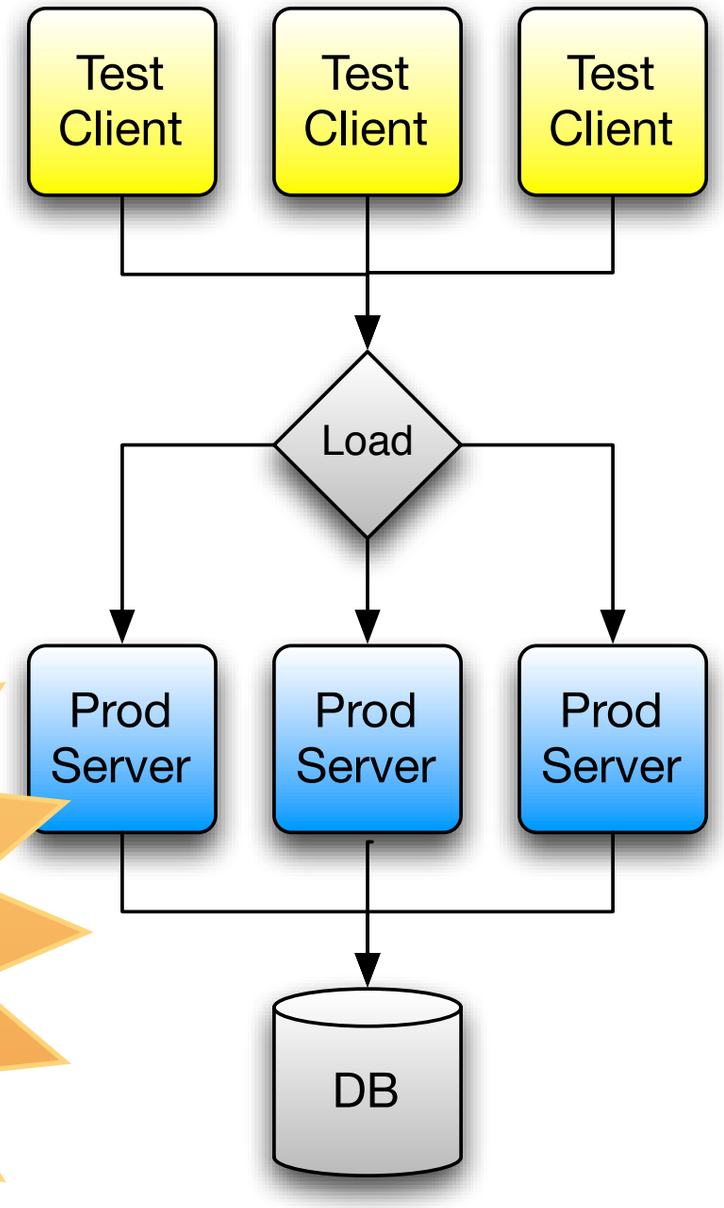


JAYWAY

Load-Test Business Case

- Physical/virtual
  - 8 servers
  - >8000 SEK / month
- Cloud
  - 2 hours / night
  - 20 nights / month
  - $2.50 per night
  - 700 SEK / month

>90% less



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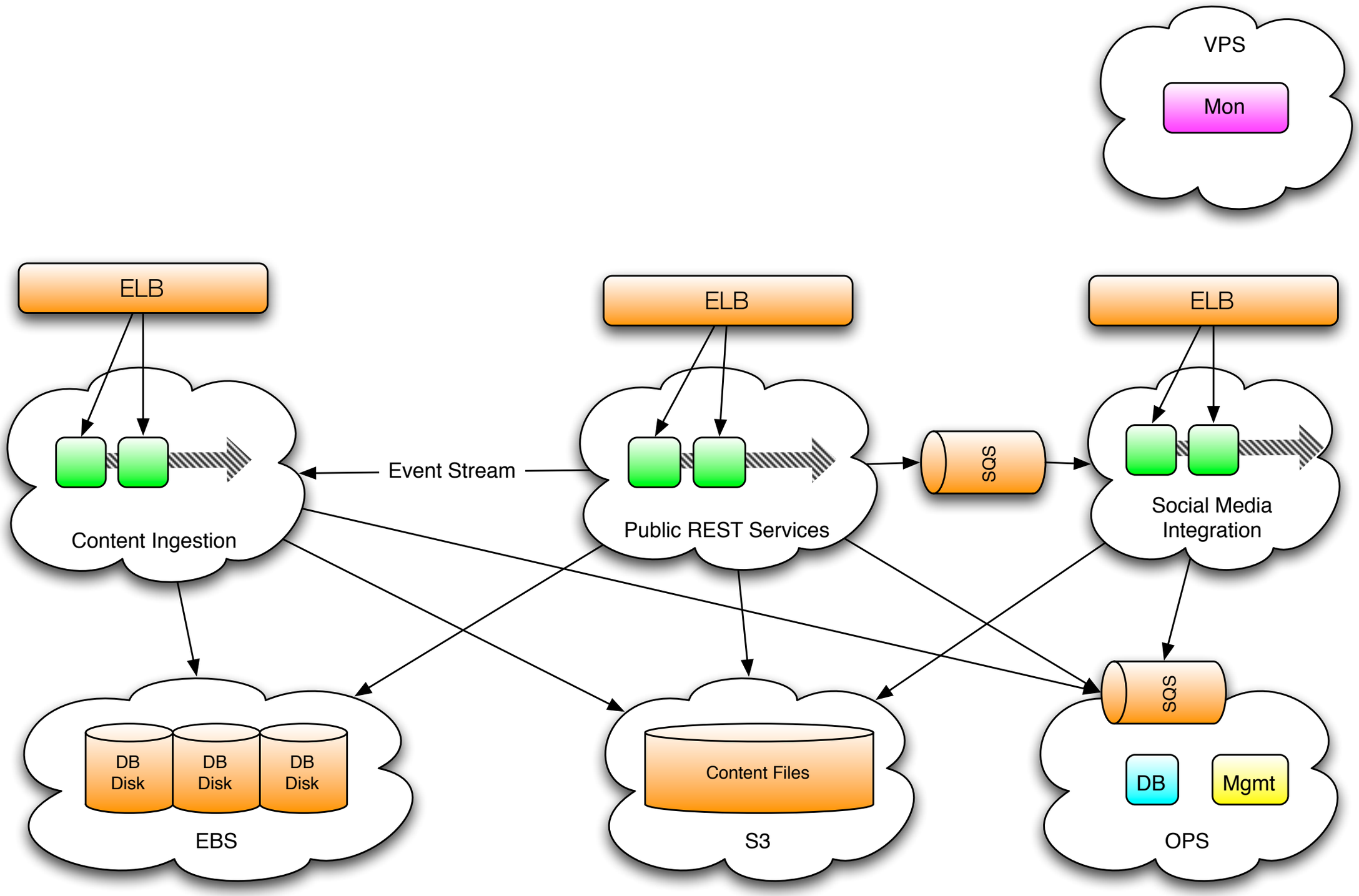
Current Project



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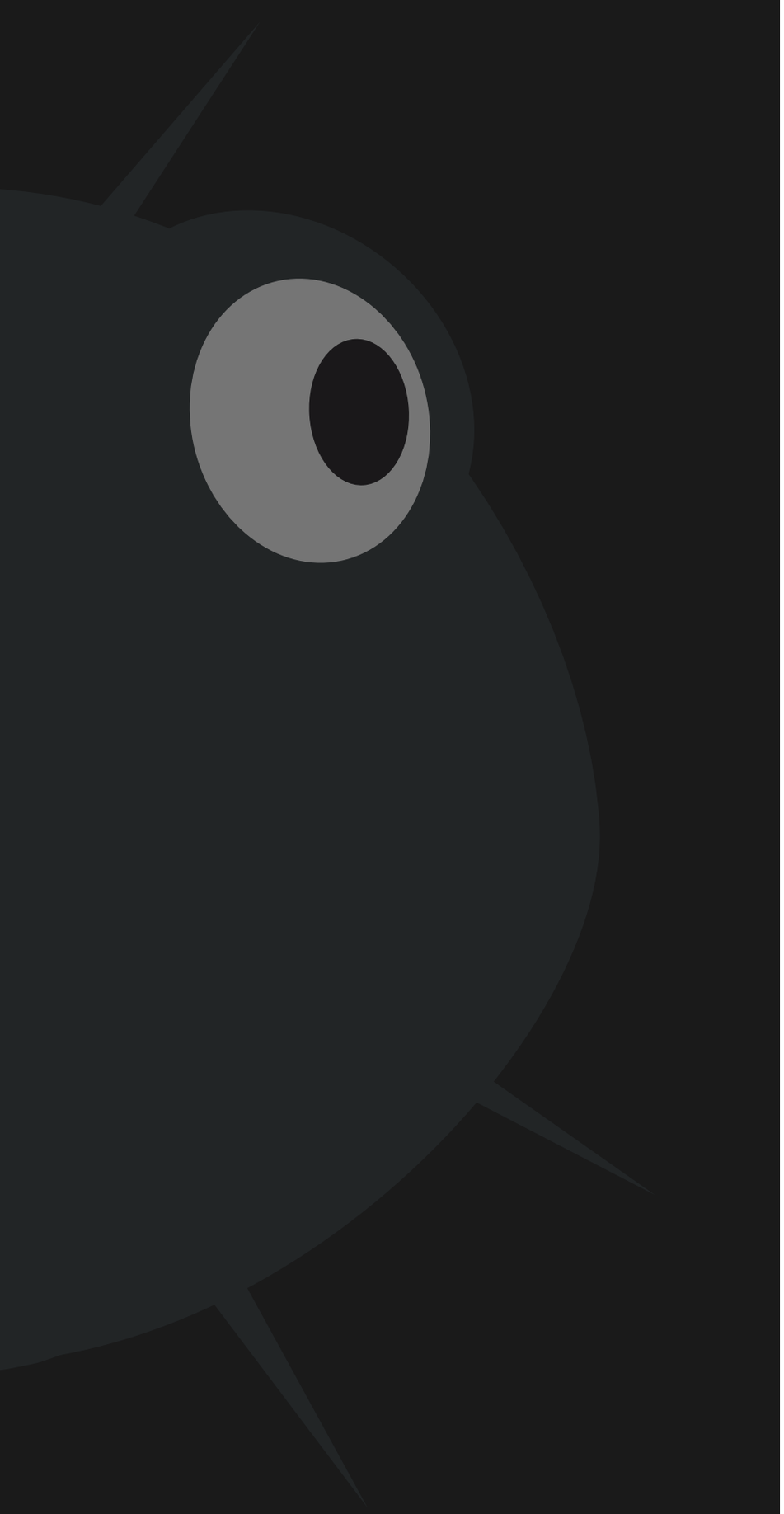
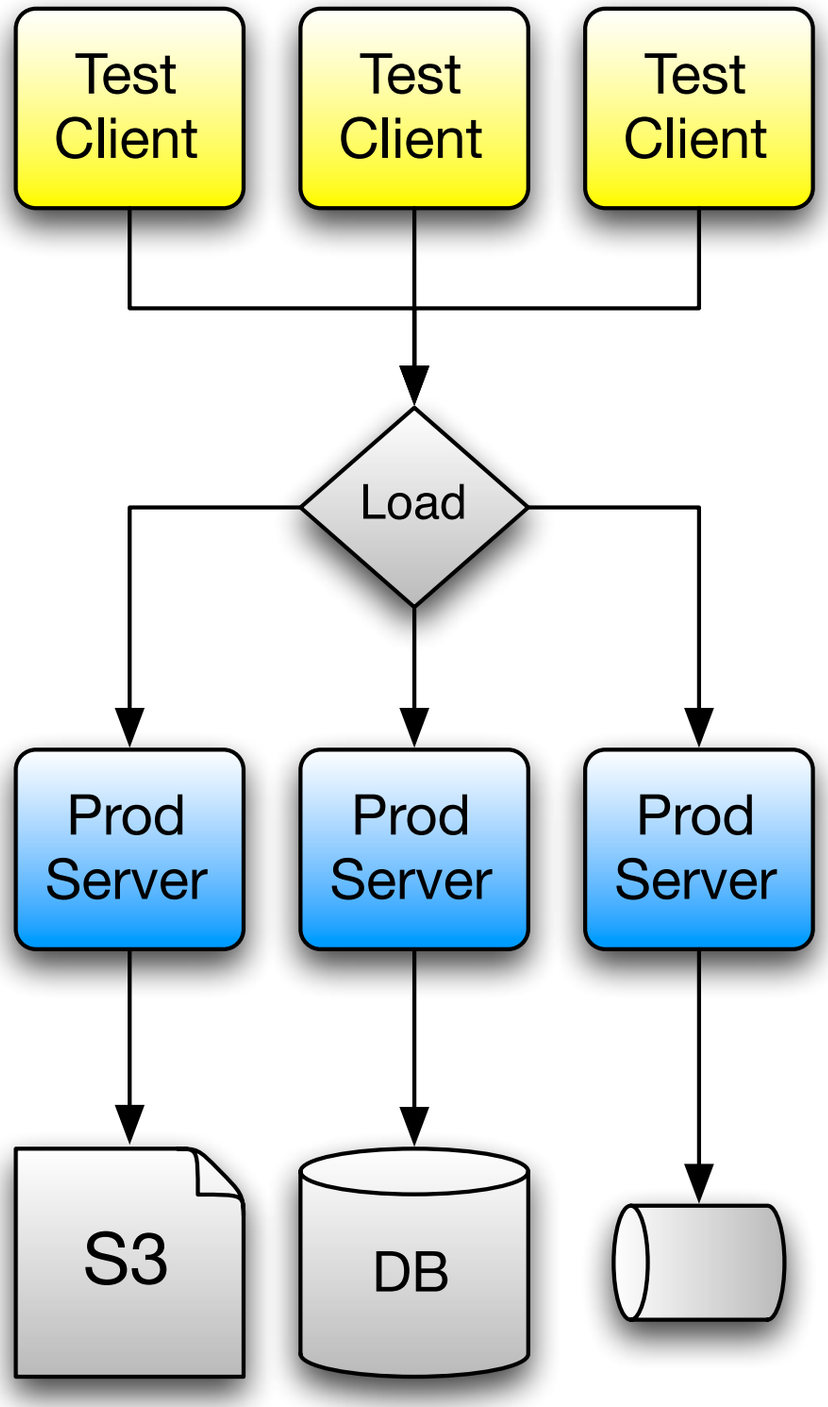


Cloud Management

With Great Power Comes Overwhelming Complexity

JAYWAY

What Do We Want?



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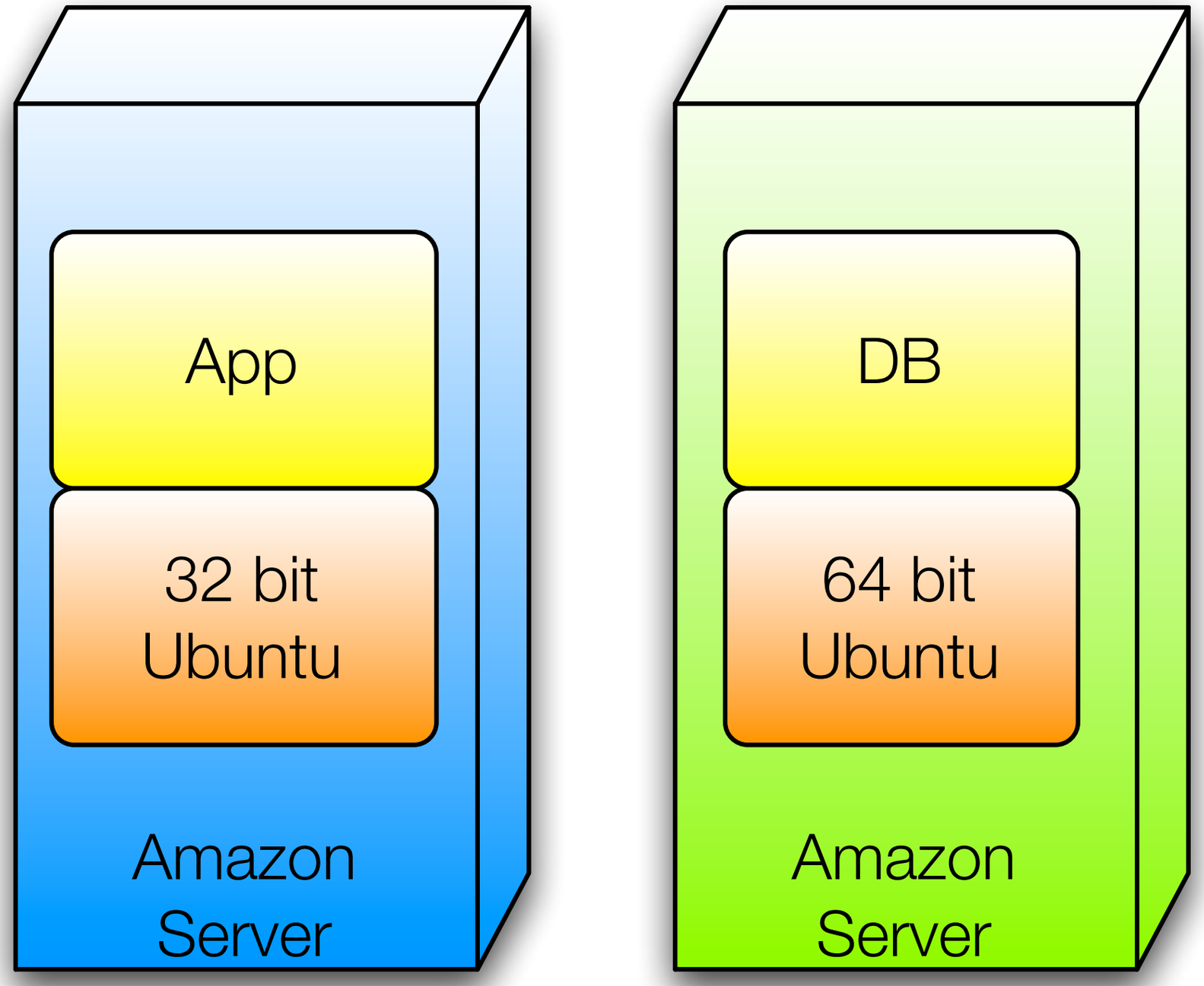
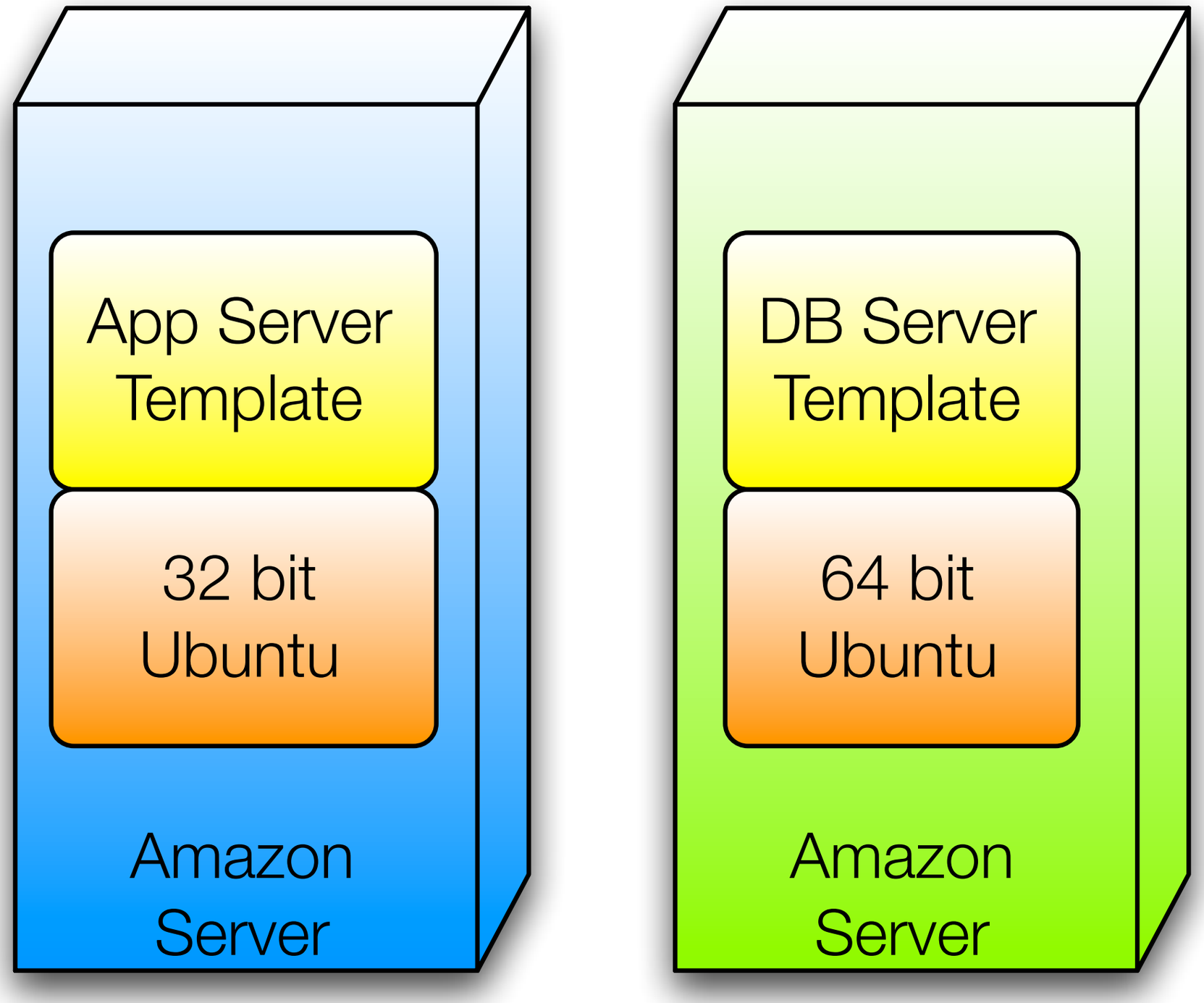
Starting Out



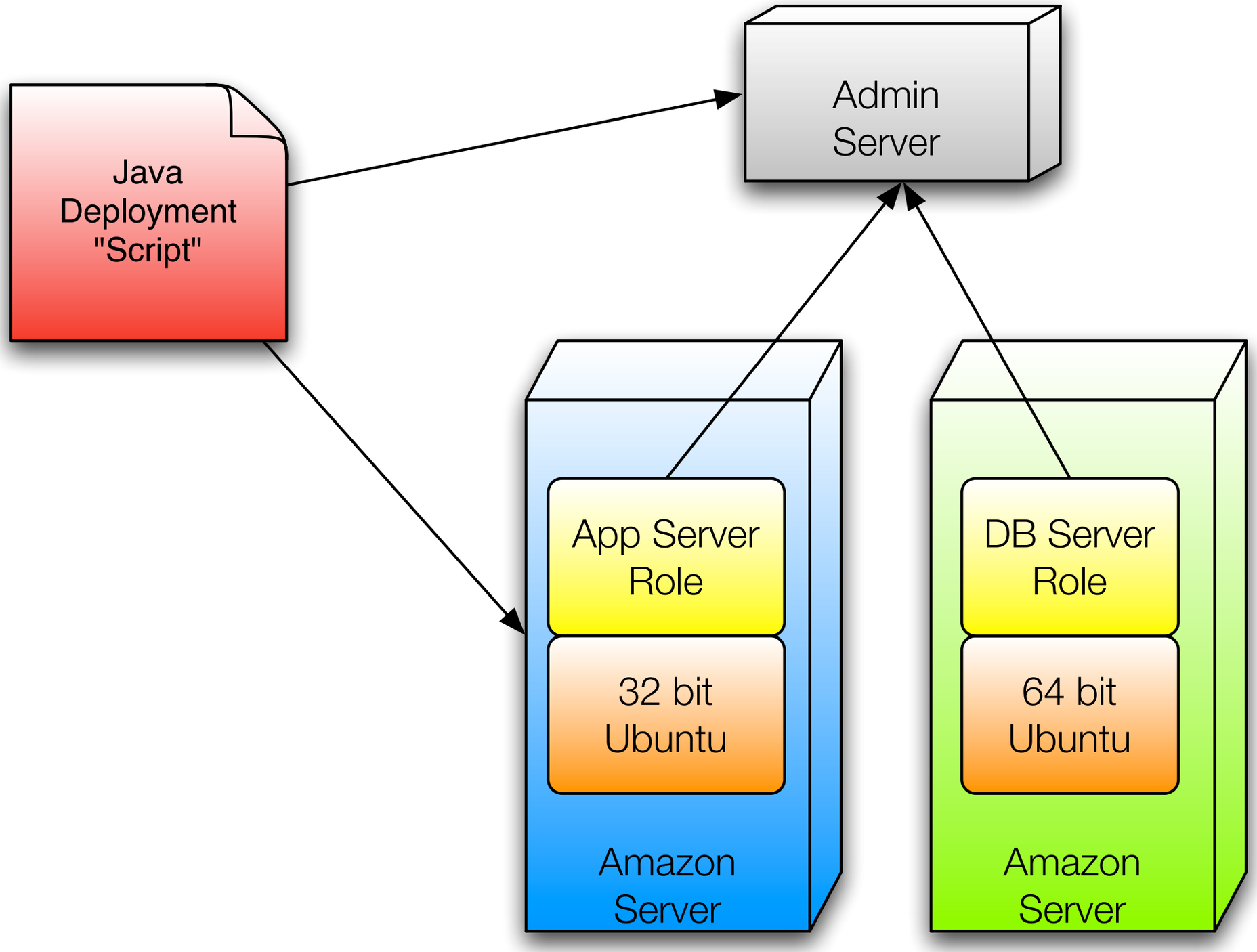
JAYWAY

Templates

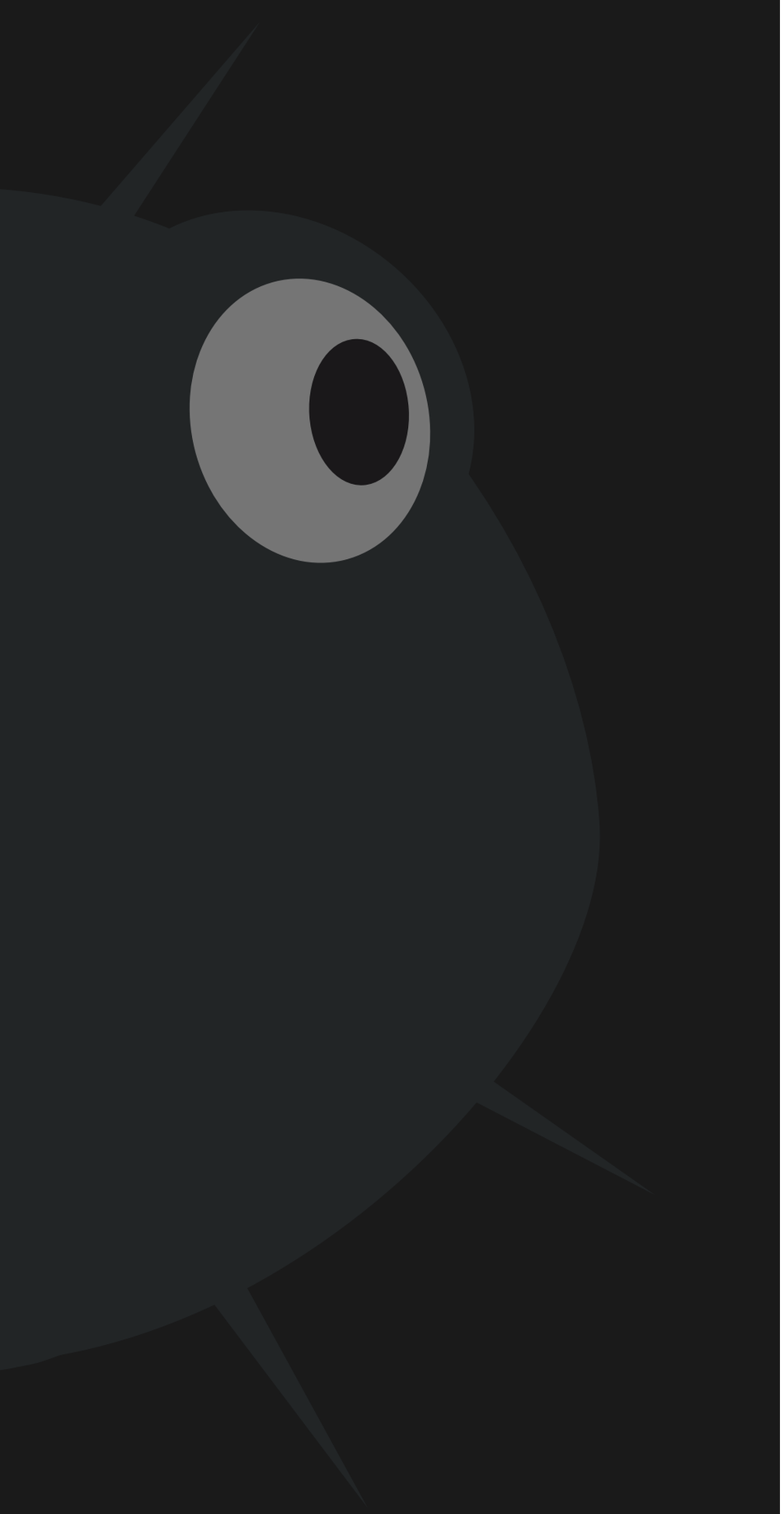


JAYWAY

Automation



JAYWAY



Experiences

JAYWAY

Our Experiences with Amazon EC2

Our Experiences with Amazon EC2

- Works Great

Our Experiences with Amazon EC2

- Works Great
- Super Fast

Our Experiences with Amazon EC2

- Works Great
- Super Fast
- They don’t Power Off Machines

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Our Experiences with Amazon EC2

- Works Great
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- It’s a Looooooong Way To North Carolina

JAYWAY

Our Experiences with Amazon EC2

- Works Great
- Super Fast
- They don’t Power Off Machines

- It’s a Looooooong Way To North Carolina
- Your App Need To Scale

Services Ecosystem

- Right Scale
  - Auto-scale based on SLA
  - Multi-server deployment plans
- Scalr.net
  - Auto-restart on failure
  - Deployment templates

Services Ecosystem

- Right Scale
  - Auto-scale bas
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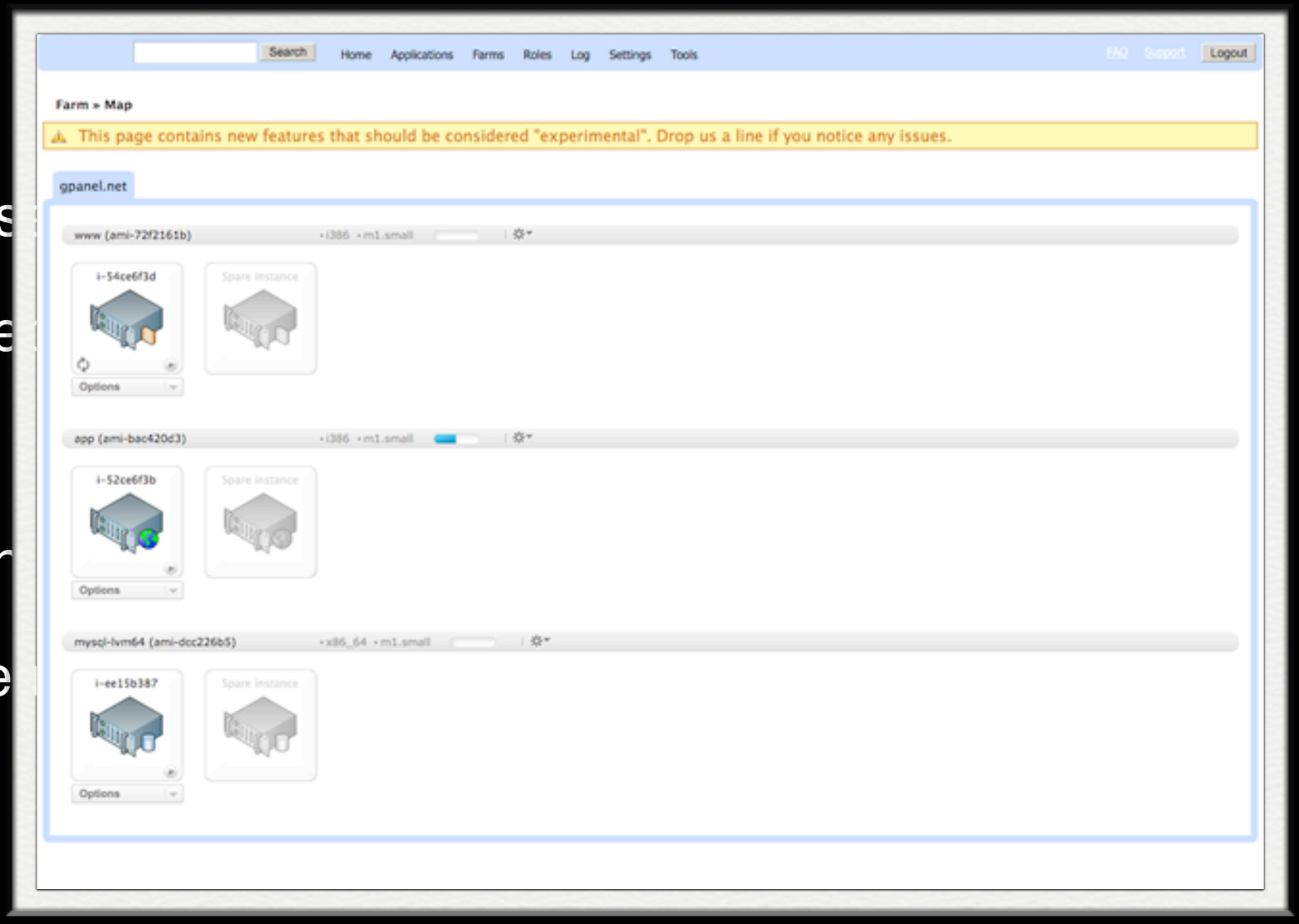
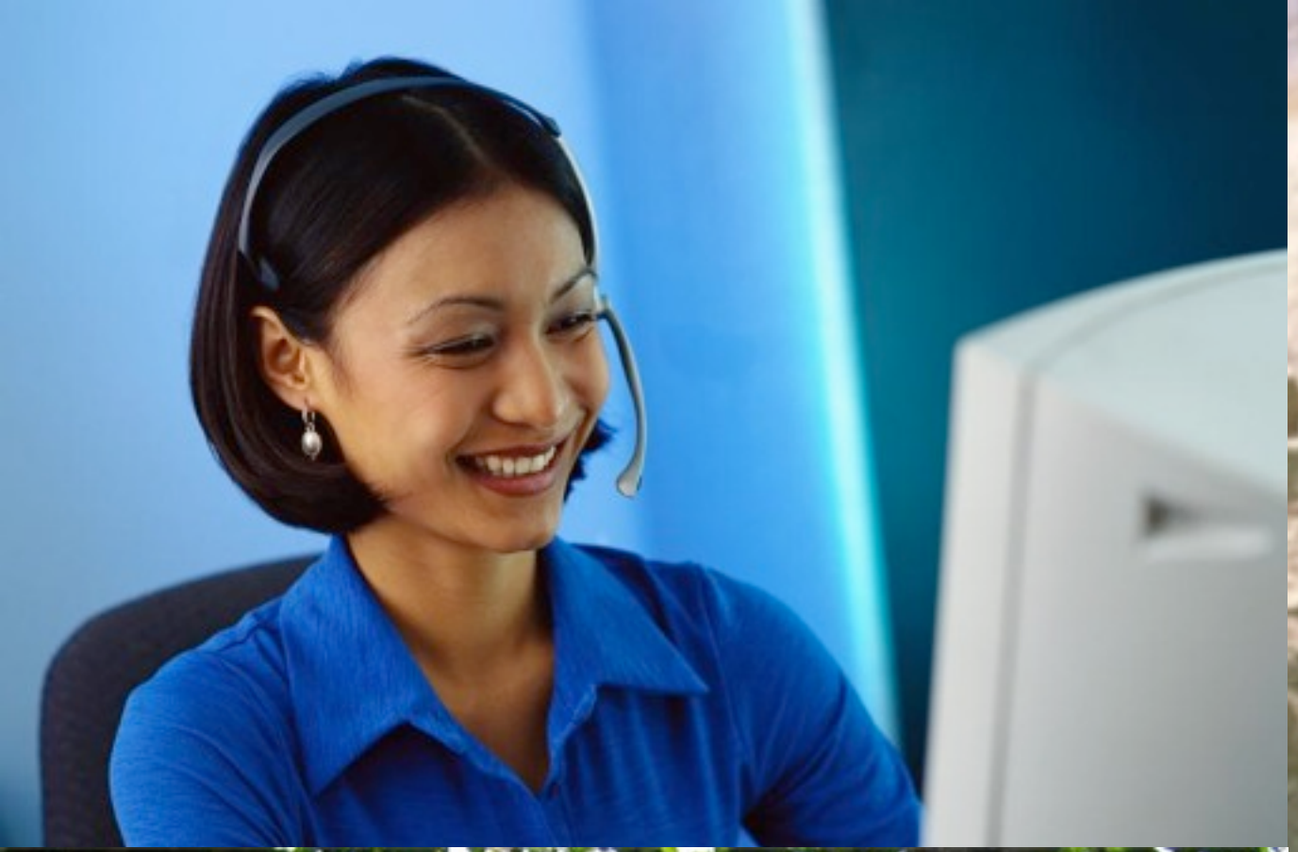


amazon web services

JAYWAY

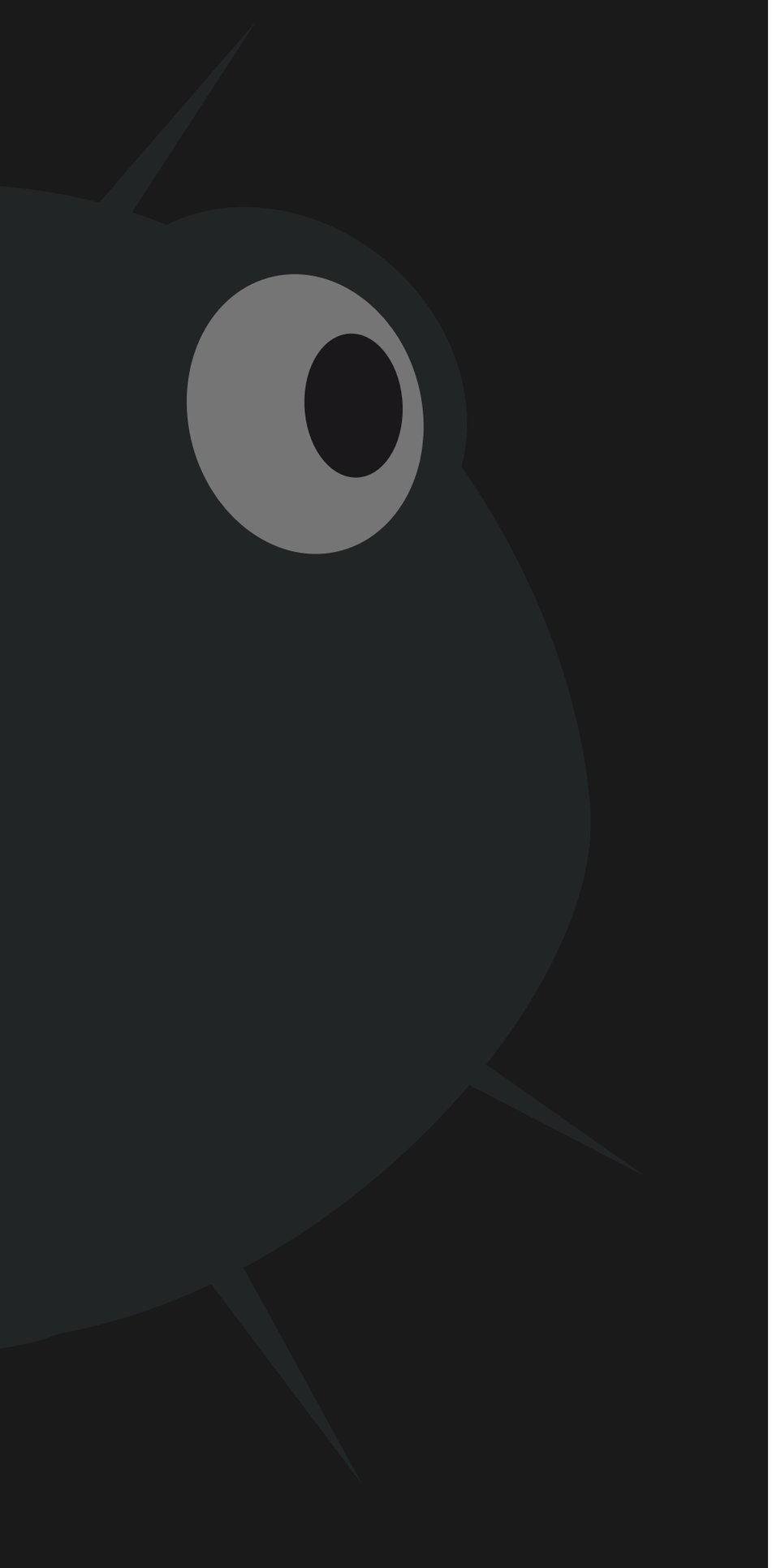


Cloud Hosting

JAYWAY

HOW COULD YOU

use one of these in your current project?



Application Clouds

Platform As A Service

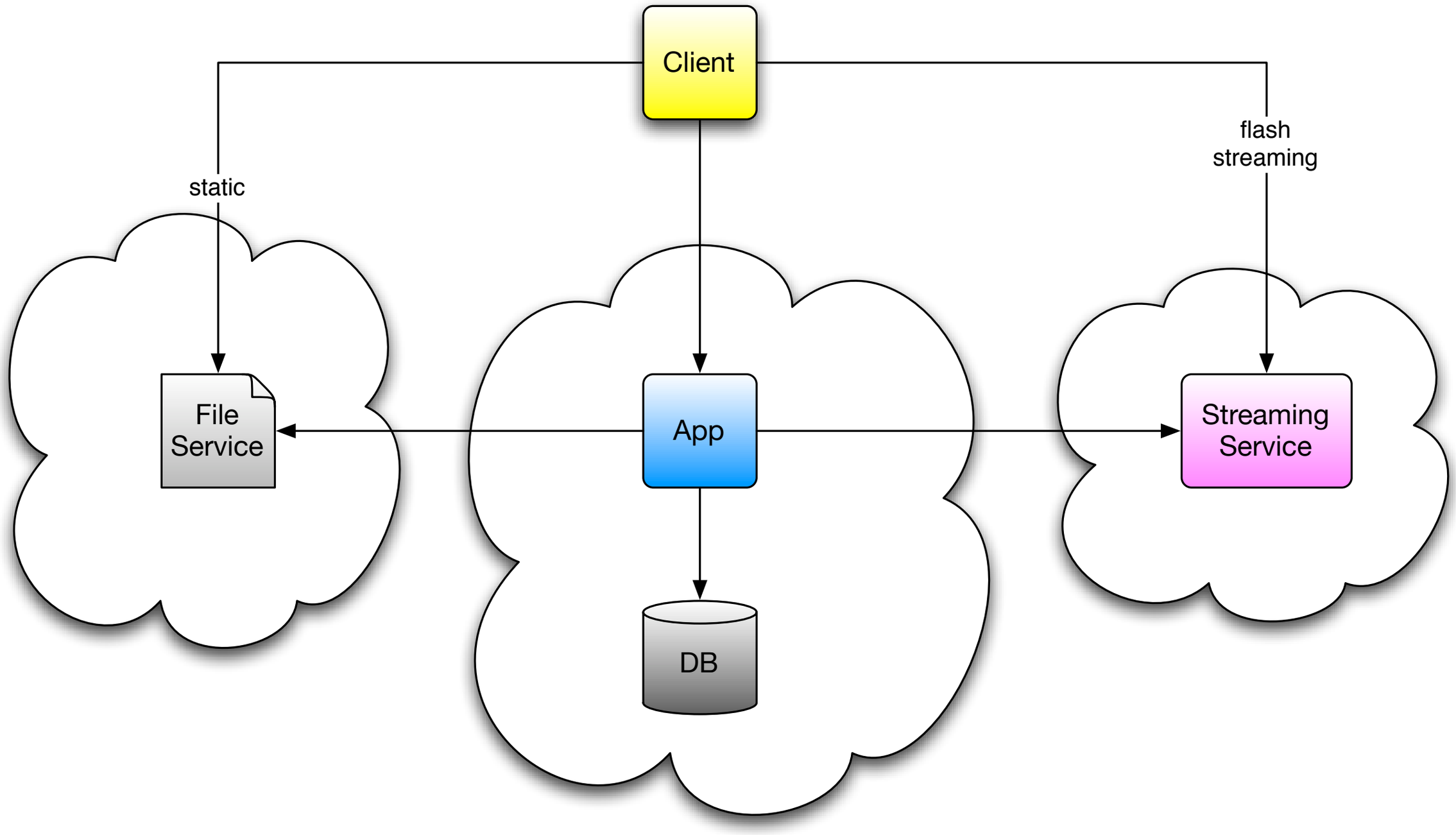
JAYWAY

Application Cloud

- Everything is Services
  - Persistence, Caching, Mail, Users
- Automatic Scaling...?
- Less Control
- Serious Buy-In

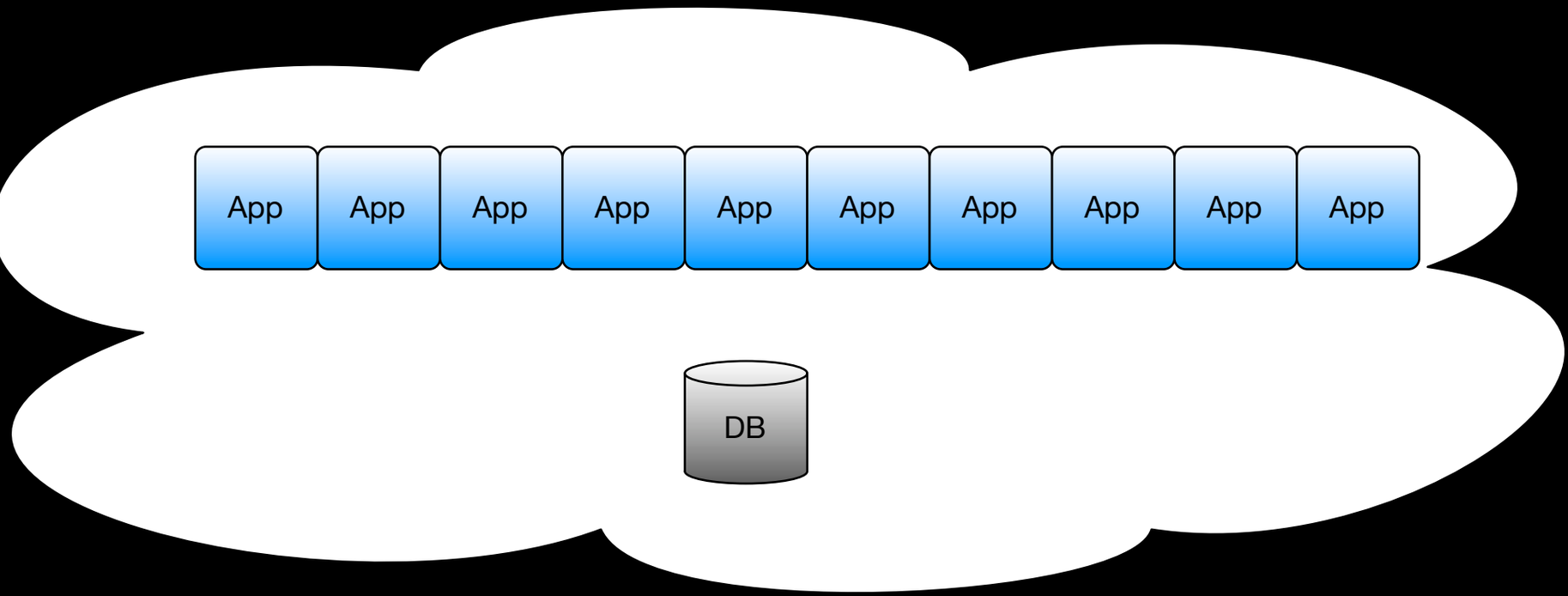
My New Cloud

My New Cloud



JAYWAY

Something's Got To Give



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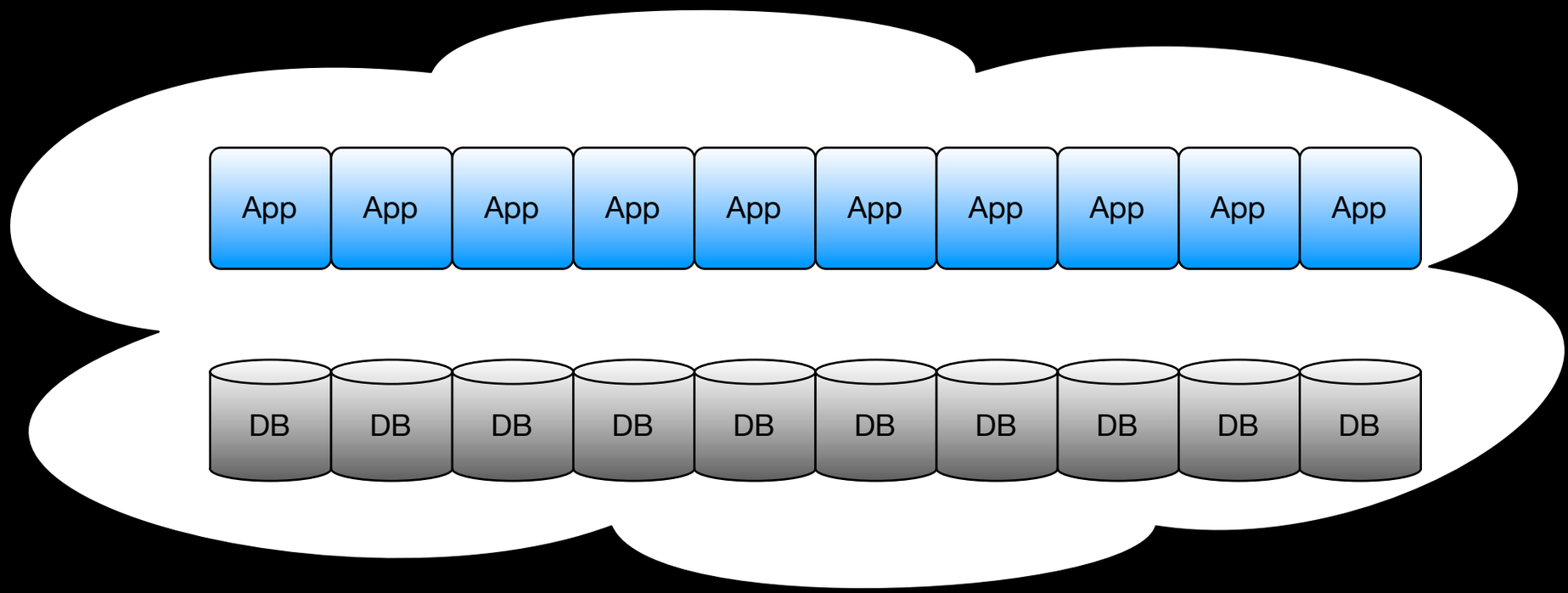

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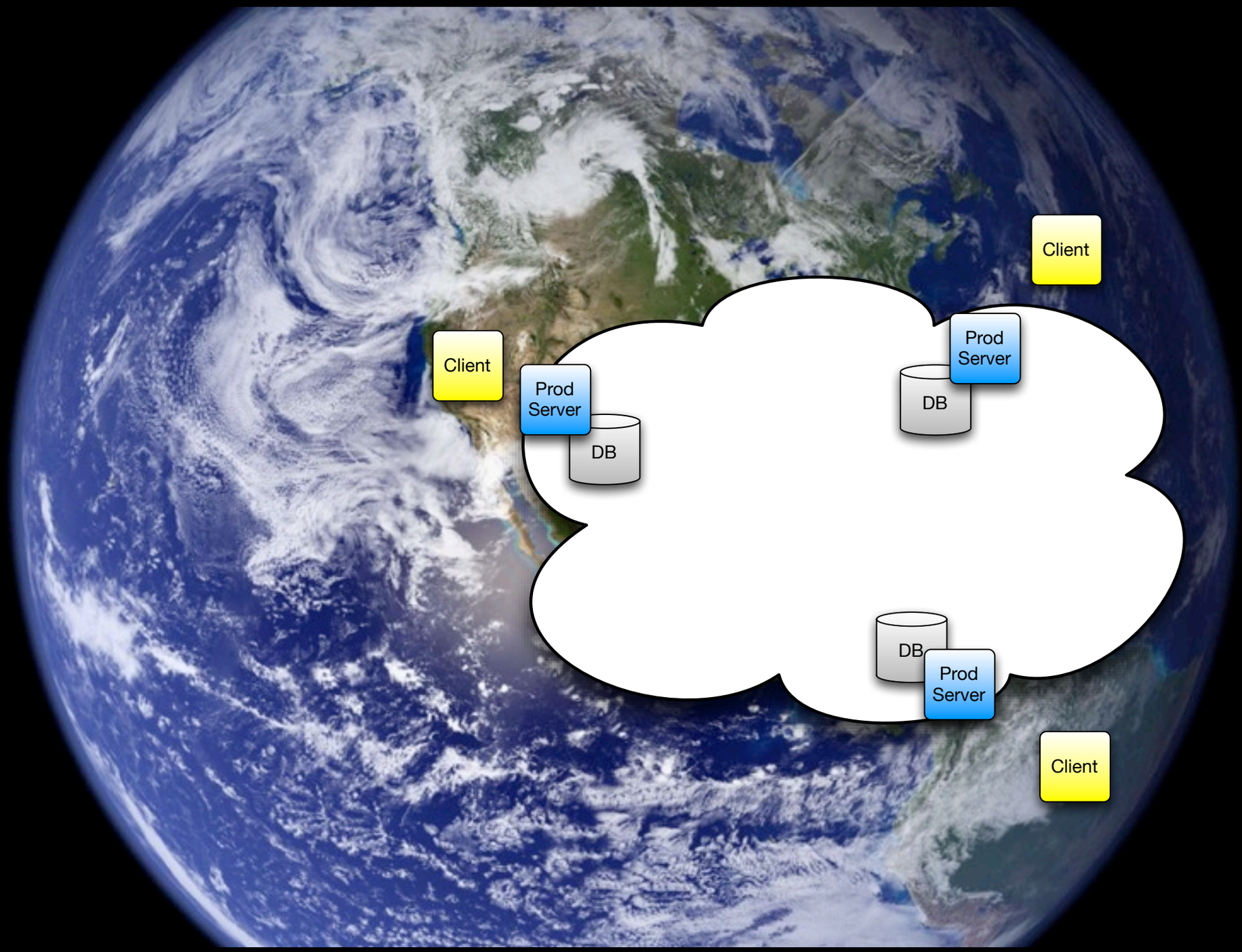

JAYWAY

BigTable

Shoping Cart		
id	user	date
100	foo	...
101	fie	...
102	fum	...

Shoping Cart Item			
id	cart	count	product
200	100	1	300
201	100	1	301

Product		
id	name	Price
300	MacBook	$999
301	MacMini	$599

	FirstName	LastName	Company	Phone
1	Adam	Skogman		+46 701 469291
2			Jayway	+46 40 6023100

JAYWAY

BigTable

Shoping Cart		
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JAYWAY

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100	foo	100		
200		100	1	300
201		100	1	301

JAYWAY

BigTable

Shoping Cart		
id	user	date
100	foo	...
101	fie	...
102	fum	...

Shoping Cart Item			
id	cart	count	product
200	100	1	300
201	100	1	301

Product		
id	name	Price
300	MacBook	$999
301	MacMini	$599

	value	**count**:macbook	**value**:macbook	count:**macmini**	value:**macmini**
foo	$1598	1	$999	1	$599
fie	$1998	2	$999		
fum	$599			1	$599

JAYWAY

BigTable

Shoping Cart		
id	user	date
100	foo	...
101	fie	...
102	fum	...

Shoping Cart Item			
id	cart	count	product
200	100	1	300
201	100	1	301

Product		
id	name	Price
300	MacBook	$999
301	MacMini	$599

foo

value	**count**:macbook	**value**:macbook	count:**macmini**	value:**macmini**	
$1598	1	$999	1	$599	t=2009-11-03 12:00

JAYWAY

New Game Rules

ACID Before

- Atomic
- Consistent
- Isolated
- Durable

BASE Today

- Basically Available
- Soft State
- Eventually Consistent

Daily Budget

JAYWAY

JAYWAY

Virtualization on Tap

JAYWAY

Scaling Business Model Virtualization on Tap

JAYWAY

Architecture Style
Scaling Business Model
Virtualization on Tap

JAYWAY

Not a Magic Silver Bullet Architecture Style Scaling Business Model Virtualization on Tap

JAYWAY

Test Env of Tomorrow

Not a Magic Silver Bullet

Architecture Style

Scaling Business Model

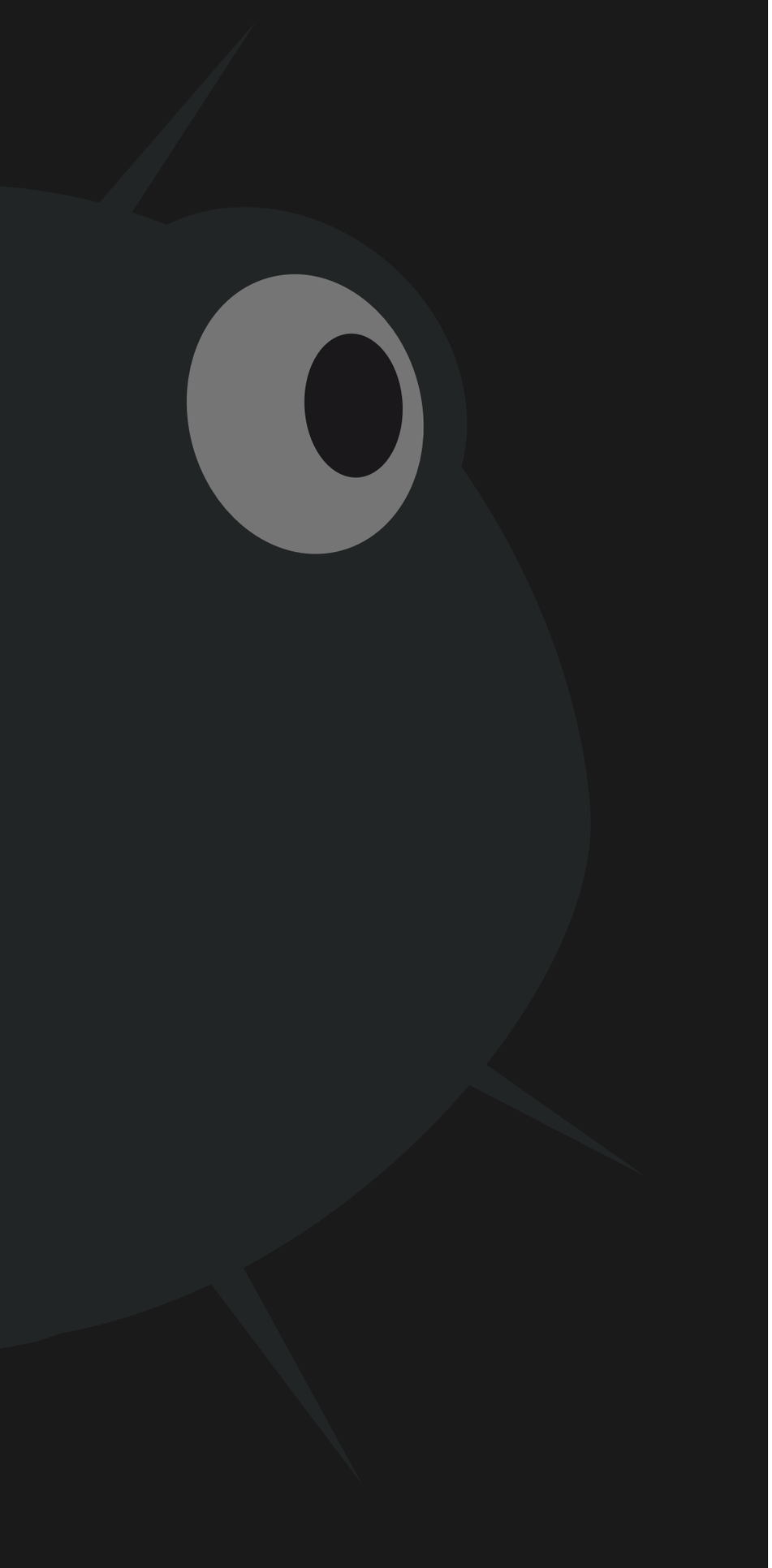
Virtualization on Tap

JAYWAY

Next:

From Zero to **Cloud**

in under 4 hours



The End

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