
AWS
re:Invent
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GAM202

How Creative Assembly delivers live games at scale with AWS

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Agenda

- Video games industry challenges
- Creative Assembly's first cloud steps
- Working with evolutionary architecture
- How to run games at scale

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Games industry challenges



Servers must scale with tens of millions of players from anywhere in the world, at the lowest possible cost



Tools must secure, process, and analyze petabytes of ever-changing data with millisecond latency in order to optimize player lifetime value (LTV)



Cloud migration from on premises can be difficult to navigate and riddled with challenges, often leaving developers wondering where to even start



Developers would rather build fun, innovative games vs. spending time and effort handling infrastructure

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AWS for Games solution areas

BUILD



Cloud game development

RUN



Game servers

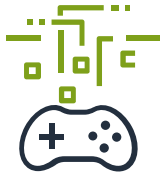


Game security

GROW



LiveOps



Game analytics



AI & ML

USE CASES AND SOLUTIONS

- Workstations
- Build pipelines
- Version control
- 3D world building

- Hosting session-based games
- Global game infrastructure

- Defend against DDOS attacks
- Protect against data breaches

- Game Services for LiveOps

- Centralized game analytics

- Community health/toxicity
- Smart acquisition and retention

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WHO IS CREATIVE ASSEMBLY

Crafting games in the countryside for 35 years

42 games to date; most recently
- Total War: WARHAMMER III
- HYENAS – new sci-fi FPS

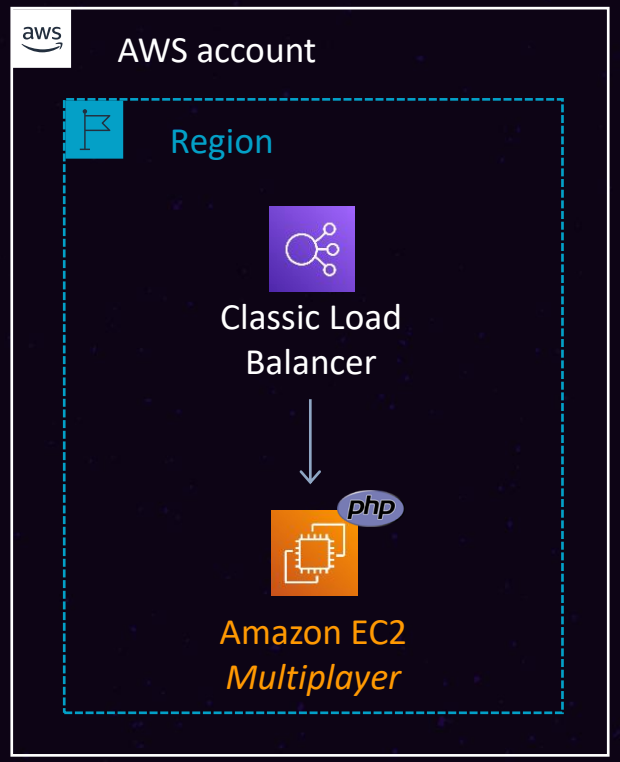
Delivering rich, connected game experiences for our millions of players

Using AWS to build an online platform to power our games



CREATIVE ASSEMBLY SEGA

WHERE DID WE START?





WHERE DID WE START?

2011: “Make an online game”

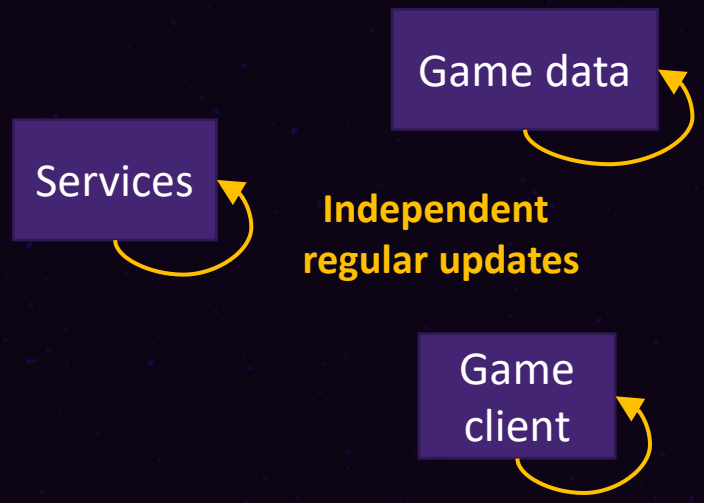
Platform design goal #1: don’t wake me up

Constraints and necessity drive innovation

WHAT WE NEEDED

Services to support constantly evolving online games

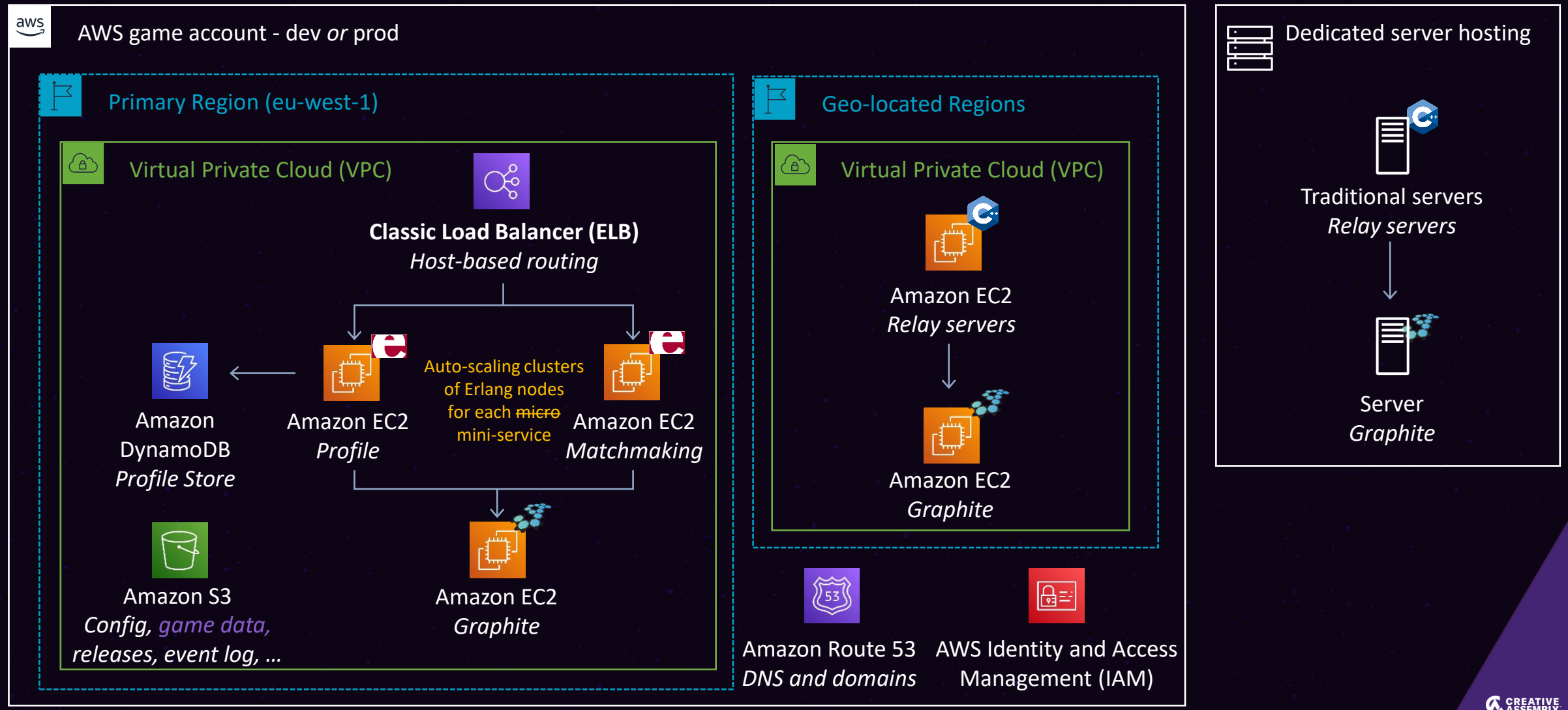
Quick iteration for services, game client and game data





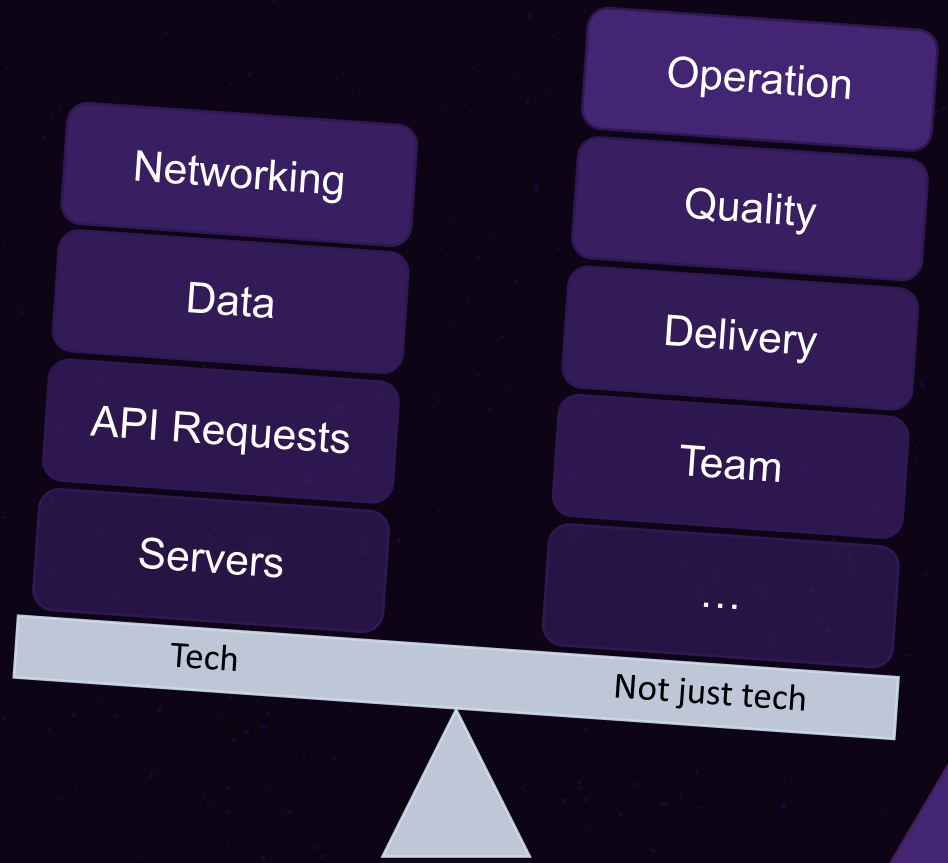
CREATIVE ASSEMBLY SEGA

TAKING SHAPE





SCALE: NOT JUST TECH



LET'S BUILD A PLATFORM!

For each set of platform goals, pick 2
(maybe 2½)



CAP: CONSISTENT,
AVAILABLE,
PARTITIONABLE



"GOOD",
FAST,
CHEAP



POWERFUL,
FLEXIBLE,
EASY



EVOLVING ALONGSIDE AWS

	Custom	Self-hosted	AWS managed
Database scaling	DynamoDB + provisioned	DynamoDB + EC2	DynamoDB + on-demand scaling
Backups	Jenkins + bash	EMR + S3	Use AWS Backup
…	Write some code	Evolve into a better version	“Turn on AWS managed one”



ABOUT THE SCALE THING...

Menagerie of games, needs a sizeable platform to power them all

- 56+ AWS services
- 30+ AWS accounts

Everything needs

- Authentication
- Build, test, deploy
- Monitor, run



IaC

For us, it always starts with Bash. But then it grows…

Bash

Bash + AWS CloudFormation

Bash + Python + AWS CloudFormation

Bash + Python + Jinja + AWS CloudFormation

Bash + Ansible + Python + Jinja + AWS CloudFormation

Rewrite with Terraform by Hashicorp



OBSERVABILITY



Metrics

- Graphite was hip, hard to scale
- Prometheus is gaining momentum



Logs

- ♥ Amazon CloudWatch Logs Insights
- Hard across 30+ accounts



Tracing

- We’re getting there..



CREATIVE ASSEMBLY SEGA

SO NOW WHAT?

It’s a constant process of evolution

- Auto scaling a lot of Erlang / Python
- More and more serverless
- A **lot** of accounts, and all-in on AWS

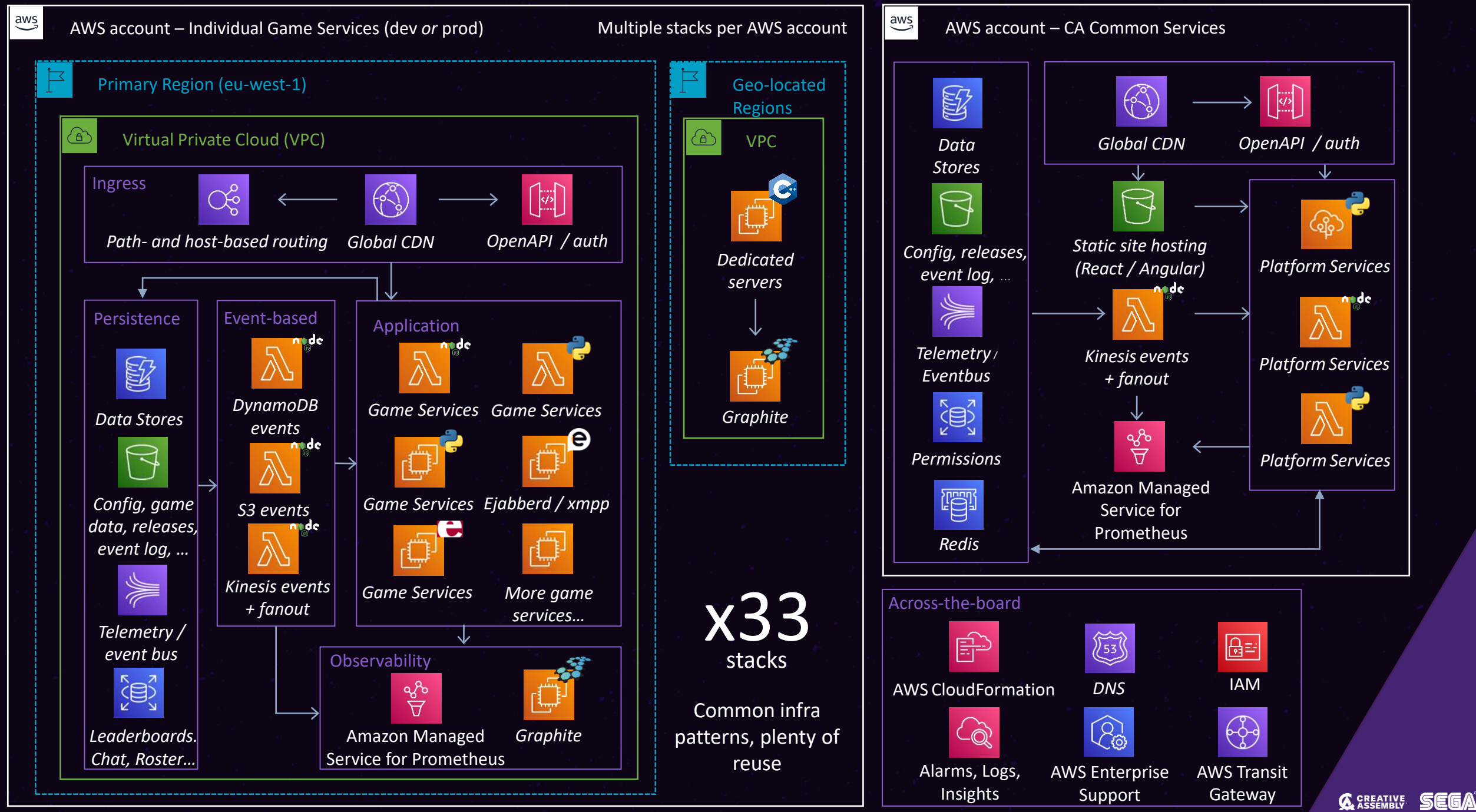
And we do it for millions of players around the world



> Failure teaches us how to succeed
> — Cao Cao

SO NOW WHAT?

Diagram incoming…


AWS account – Individual Game Services (dev *or* prod)
Multiple stacks per AWS account
Primary Region (eu-west-1)
Virtual Private Cloud (VPC)
Ingress
Path- and host-based routing
Global CDN
OpenAPI / auth
Persistence
Data Stores
Config, game data, releases, event log, …
Telemetry / event bus
Leaderboards. Chat, Roster…
Event-based
DynamoDB events
S3 events
Kinesis events + fanout
Application
Game Services
Game Services
Game Services
Ejabberd / xmpp
Game Services
More game services…
Observability
Amazon Managed Service for Prometheus
Graphite
Geo-located Regions
VPC
Dedicated servers
Graphite
x33
stacks
Common infra patterns, plenty of reuse
AWS account – CA Common Services
Data Stores
Config, releases, event log, …
Telemetry / Eventbus
Permissions
Redis
Global CDN
OpenAPI / auth
Static site hosting (React / Angular)
Kinesis events + fanout
Amazon Managed Service for Prometheus
Platform Services
Platform Services
Platform Services
Across-the-board
AWS CloudFormation
DNS
IAM
Alarms, Logs, Insights
AWS Enterprise Support
AWS Transit Gateway

WHAT'S NEXT?

More games!

Plus for the platform:

- Ease of use and integration
- Efficiency and automation
- Game team self-sufficiency

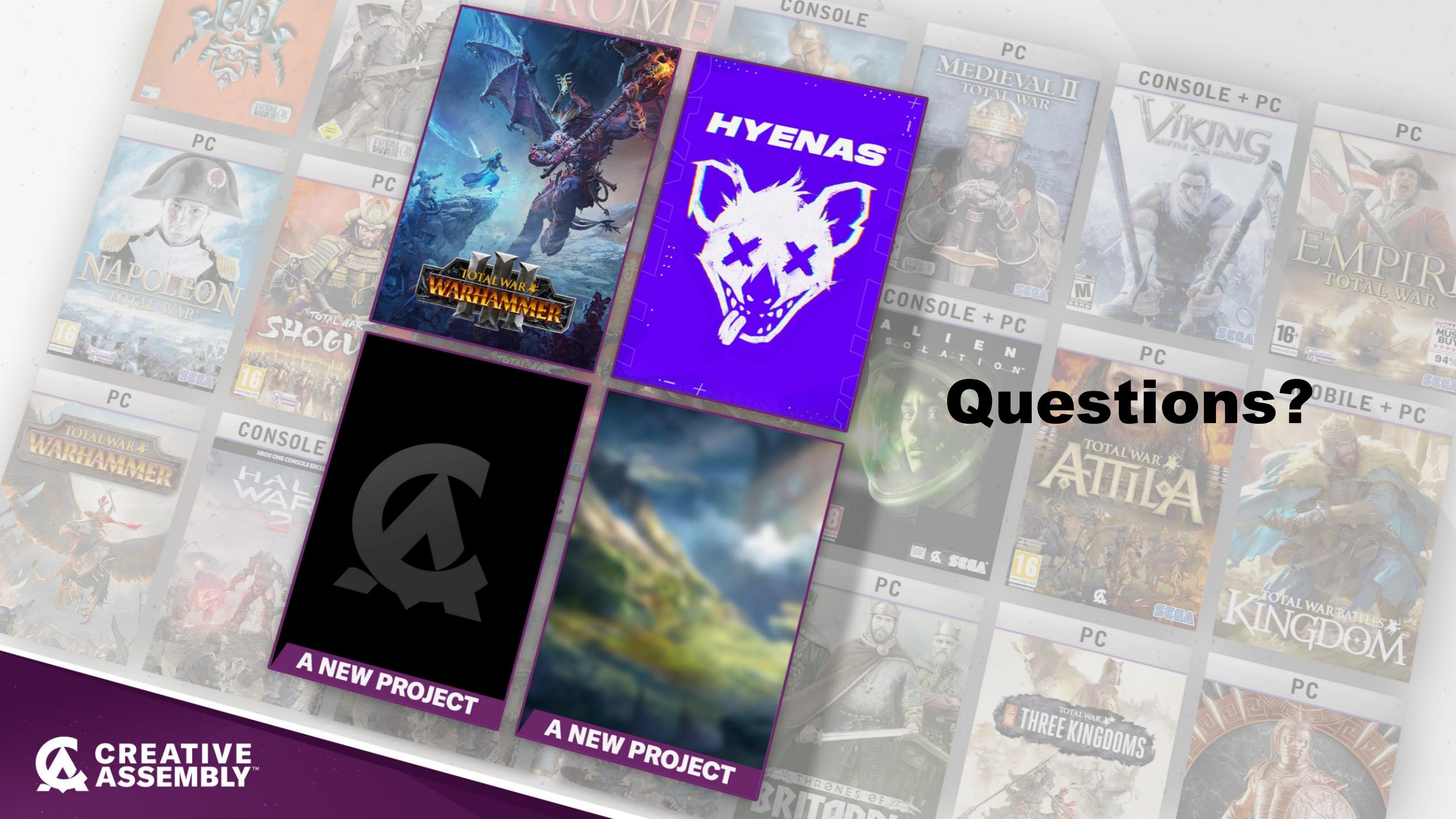


TAKEAWAY

Undifferentiated heavy lifting? No.

Just let AWS do the boring stuff




TOTAL WAR WARHAMMER III
HYENAS
A NEW PROJECT
A NEW PROJECT
Questions?
CREATIVE ASSEMBLY

Thank you!

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