
AWS
re:Invent

GAM304

How Sony Interactive Entertainment renders with AWS

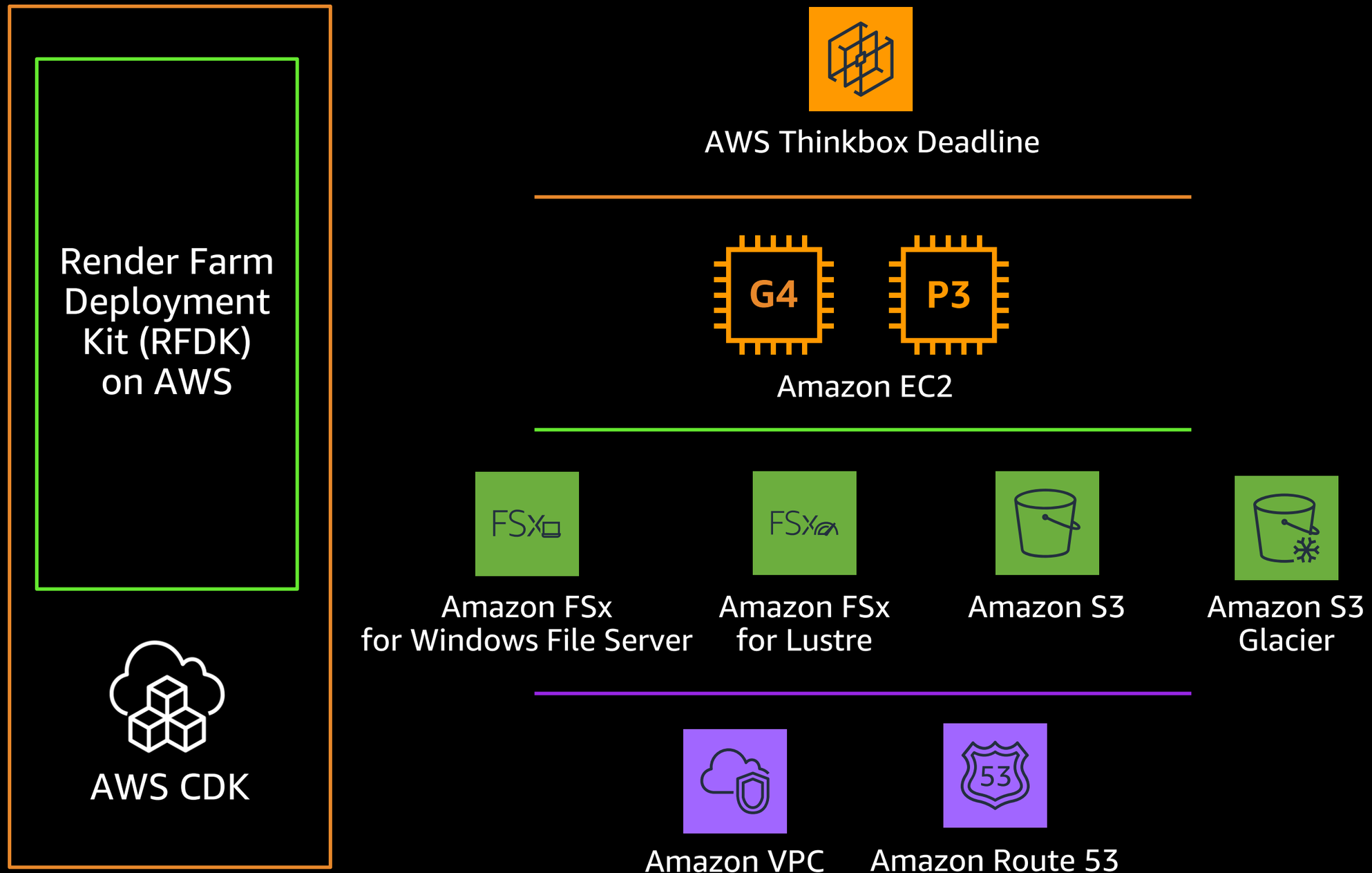
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AWS re:Invent

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Render Farm Deployment Kit (RFDK) on AWS
AWS CDK
AWS Thinkbox Deadline
G4
P3
Amazon EC2
FSx
Amazon FSx for Windows File Server
FSx
Amazon FSx for Lustre
Amazon S3
Amazon S3 Glacier
Amazon VPC
53
Amazon Route 53


PlayStation®


Our
challenge

Headed to the cloud





Guiding principles

“Rendering 12 times faster than our on-prem farm saved our bacon!”

Mike Becke

Manager, Motion Graphics

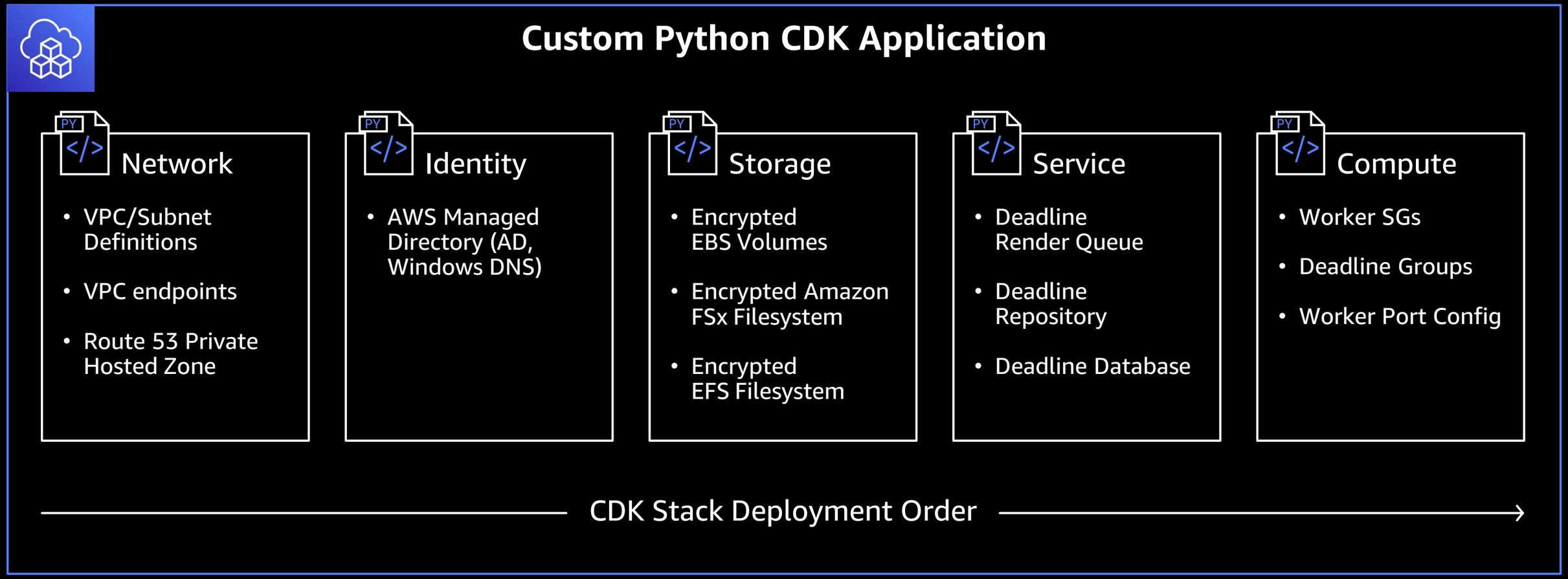


Key engineering goals

- A secure, reproduceable and cost attributable video render solution that could be securely deployed into Sony private VPCs
- Infrastructure components that could rapidly provision, scale, and deconstruct in response to customer demand and delivery targets
- Capability to render 4K60 Cinema4D jobs that primarily rely on GPU processing (example Maxon Redshift) and faster than our existing on-prem solution

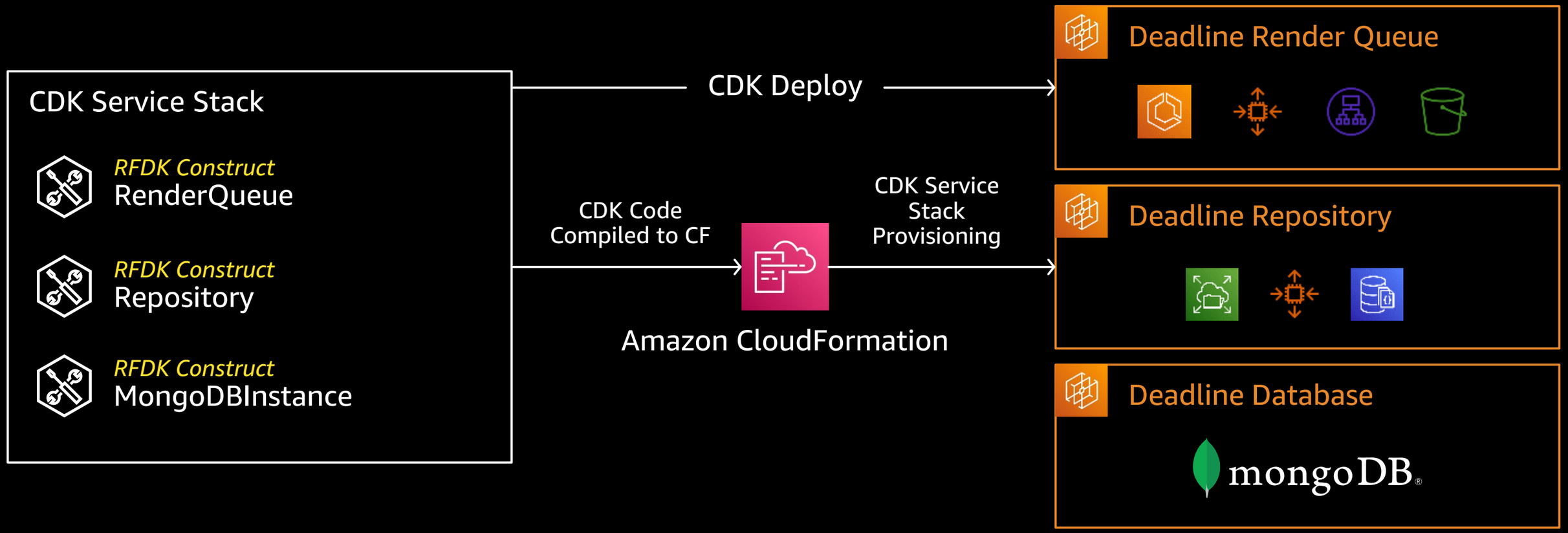
Key engineering decision #1

Define and deploy infrastructure as code using AWS CDK



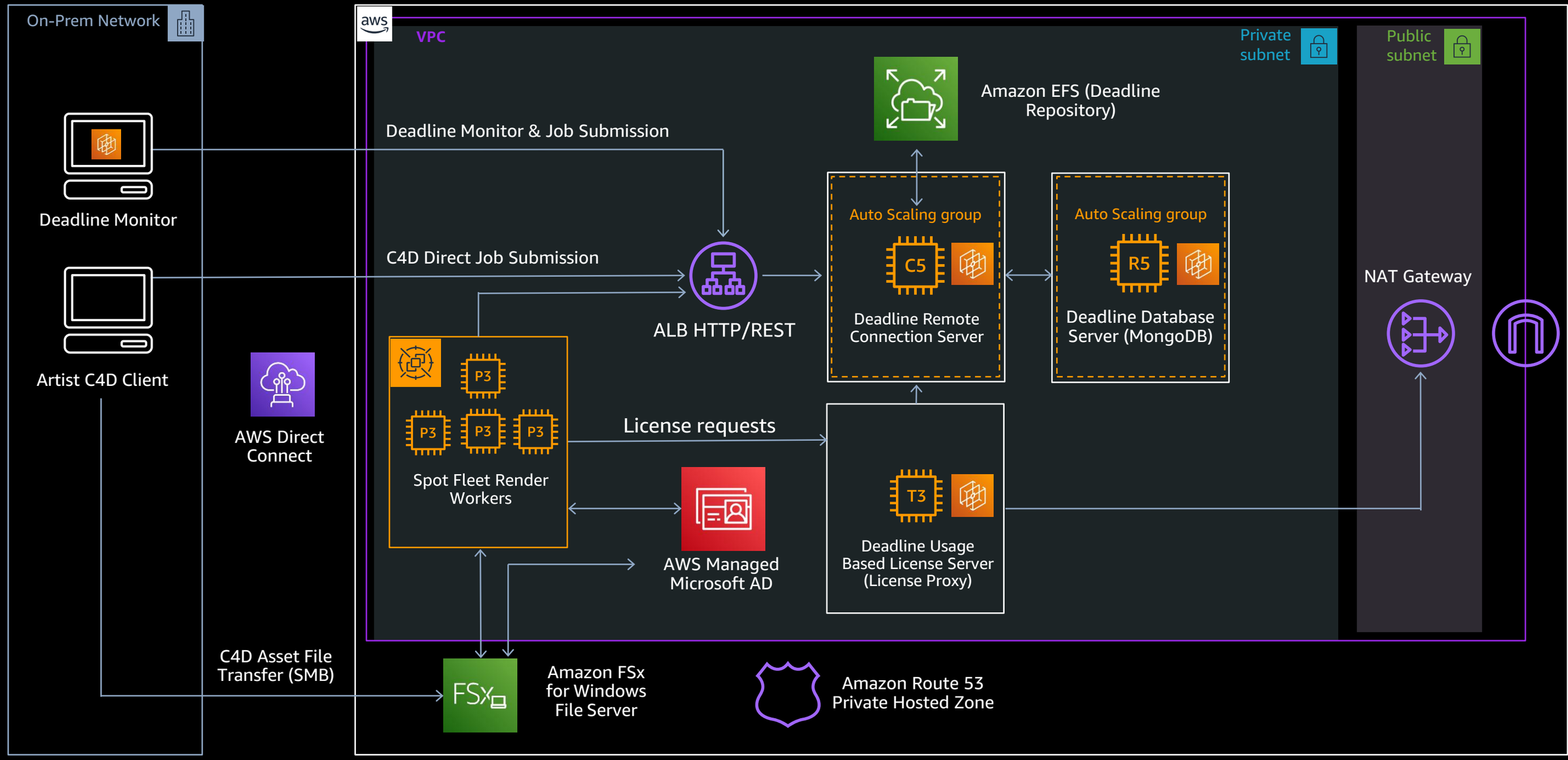
Key engineering decision #2

Provision Deadline render components using RFDK



https://docs.aws.amazon.com/rfdk/api/latest/

High-level proof of concept architecture



Key engineering decision #3

Deliver render workers with AWS P3/G4 instances and Windows 2019 Server

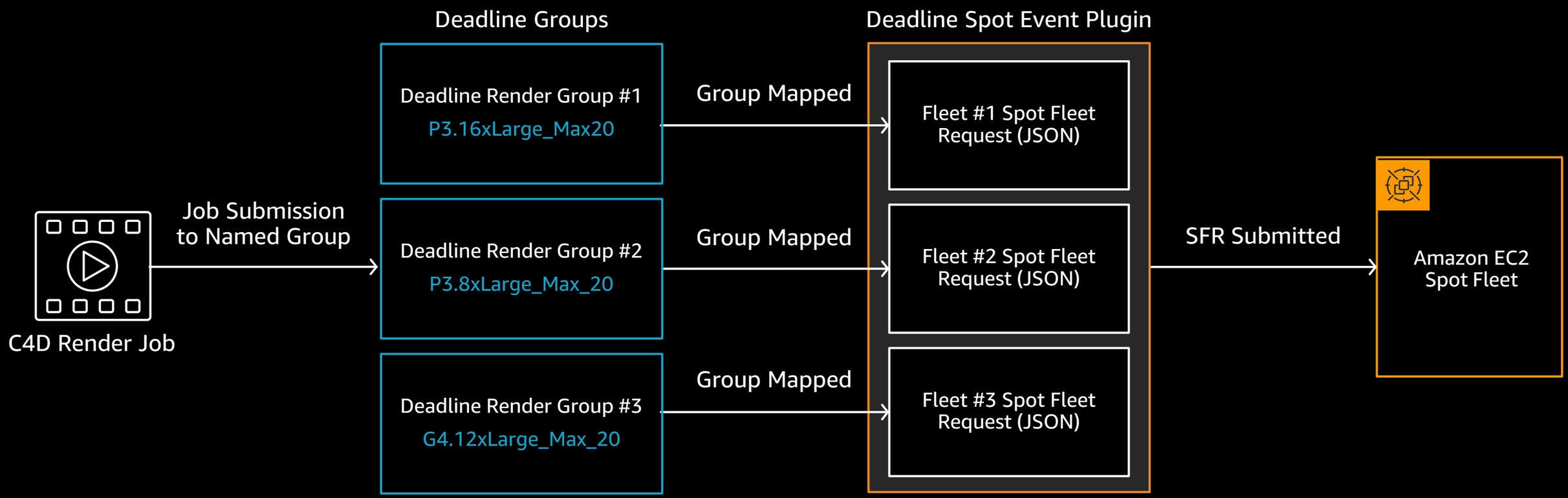
Tangible drivers and benefits

- Maximize number of CUDA Cores and available VRAM
- Can use the NVIDIA Windows TCC Driver in TCC Mode
- Fully leverage Redshift multi-GPU functionality
- Maximize “pay as you go” render license
- Confidence in proven production workflow
- Enabled the rendering of complex scenes

Key engineering decision #4

Leverage Deadline Spot Integration for render workers

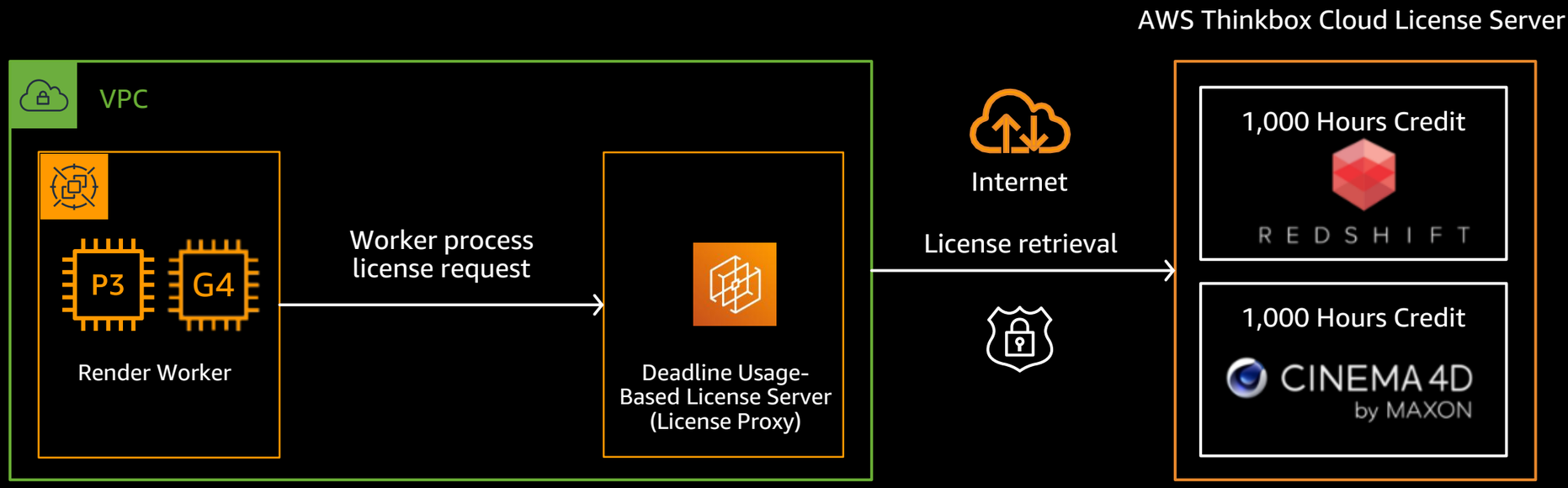
- Deadline Spot Instance Integration is out-of-the-box functionality using the Deadline Spot Event Plugin



Key engineering decision #5

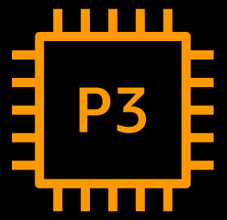
Fully enable usage-based licensing in the cloud

- License C4D and Redshift render by the minute and pay by the hour
- Scale out free of license anxiety
- Deadline licensing is **FREE** when using EC2 for render workers



Results (single frame render)

Rendering single C4D production 4K frame with Deadline and Redshift





Instance/GPU Family	Size	# GPU	Pure Render Time
P3 (Tesla v100)	2xLarge	1	43 minutes
P3 (Tesla v100)	8xLarge	4	17 minutes
P3 (Tesla v100)	16xLarge	8	5 minutes
G4 (Tesla T4)	2xLarge	1	1 hour, 57 minutes
G4 (Tesla T4)	12xLarge	4	28 minutes
G4 (Tesla T4)	16xLarge	1	1 hour, 48 minutes

Spot Fleet render (600 frames)

Rendering 600 frames 4K60 C4D production job with Deadline and Redshift

Spot Fleet Size & Type	# GPUs	# NVidia CUDA Cores
20 x p3.16xLarge	160	819,200

C4D Job Complexity	Average Frame Task Time	Job Elapsed Time
High	11 min	6 hrs
Medium	8 min	4 hrs
Low	3 min	2 hrs

Going faster

- Pre-convert scene textures for Redshift
- For CUDA Apps ensure Windows G4 instances are using Nvidia Tesla Driver in TCC mode (`nvidia-smi -dm`)
- Optimize GPU clock speed (`nvidia-smi -ac`)
- Pay attention to GPU affinity in Deadline
- Keep an eye on Amazon FSx throughput capacity as you scale out

“Rendering 12 times faster than our on-prem farm saved our bacon!”

Mike Becke

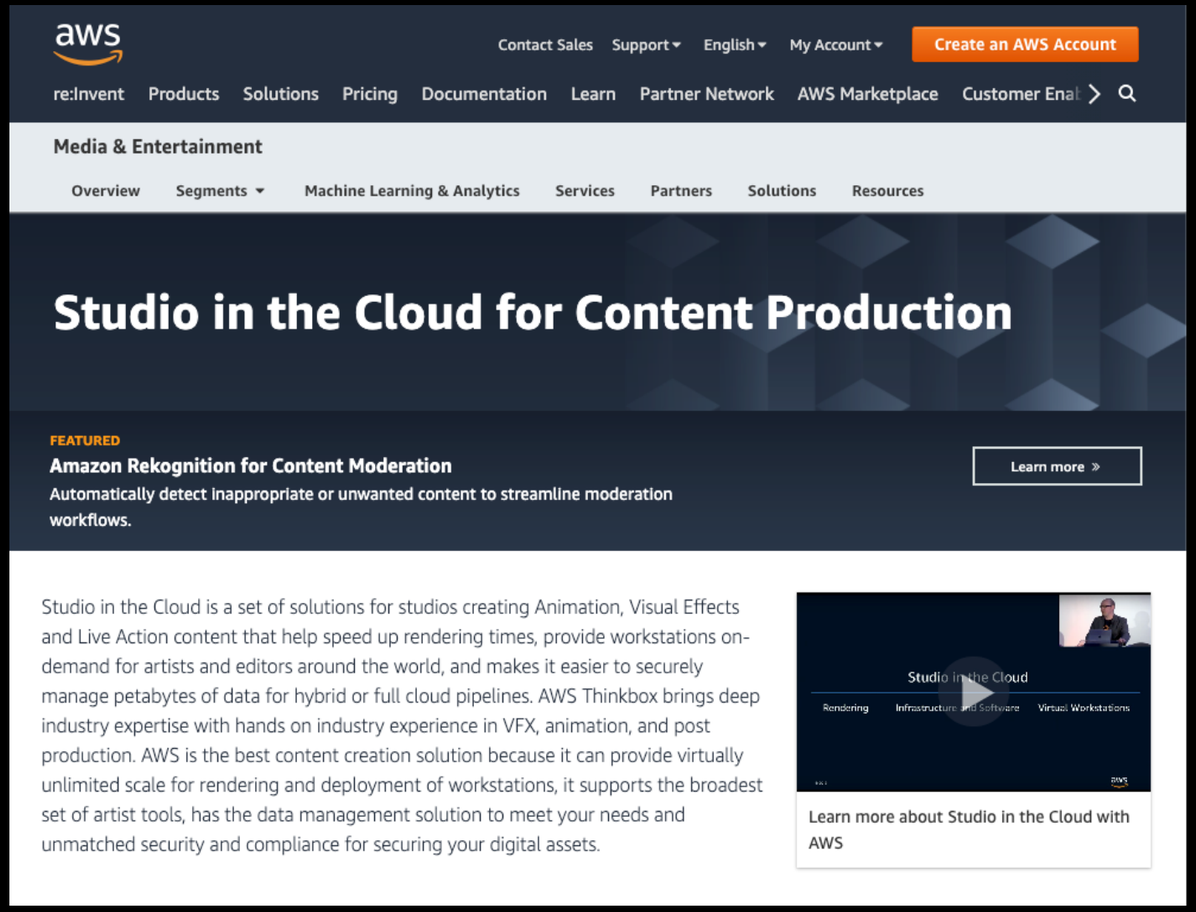
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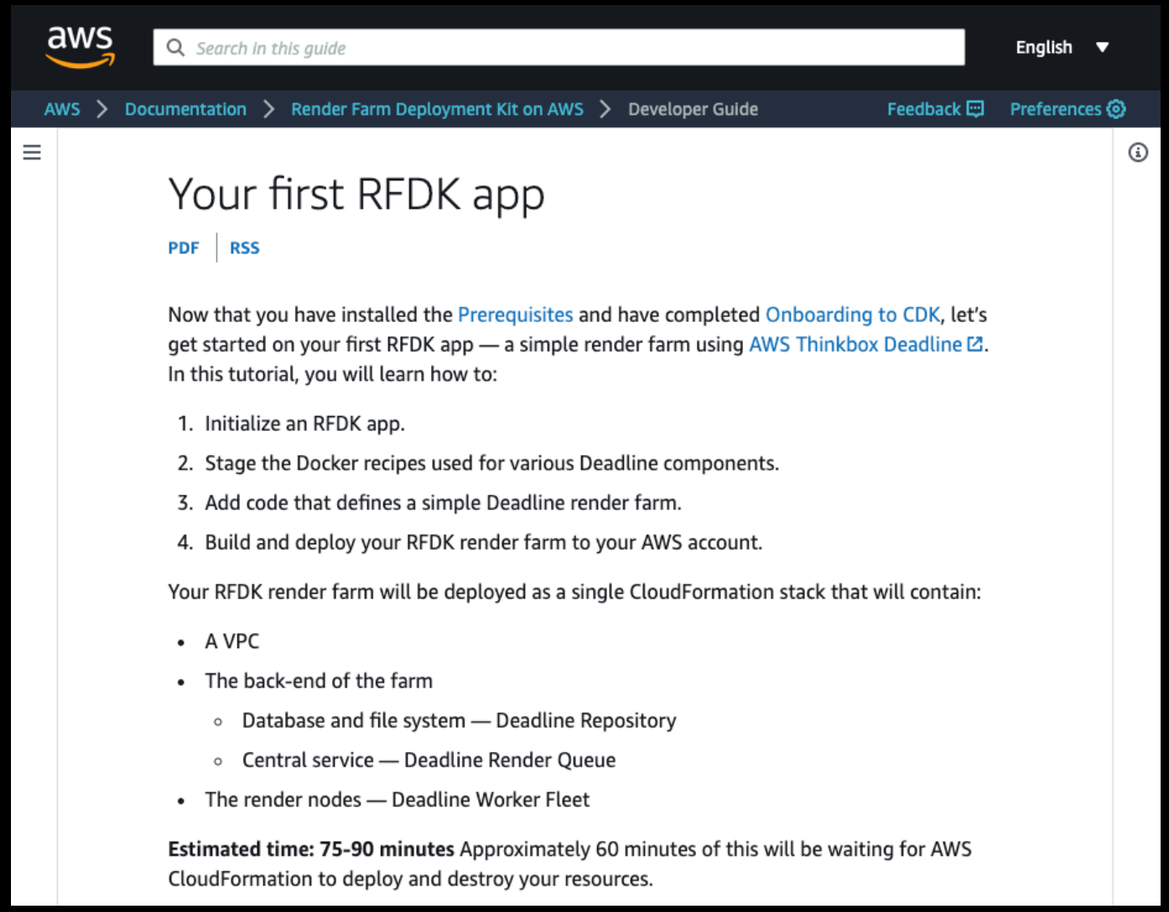




What’s next

Getting started





https://aws.amazon.com/media/production

https://docs.aws.amazon.com/rfdk

Thank you!



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