
AWS
re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

CMP208

Run large-scale graphics workloads with AWS, featuring Mircom and Snap

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Tech Lead
Snap

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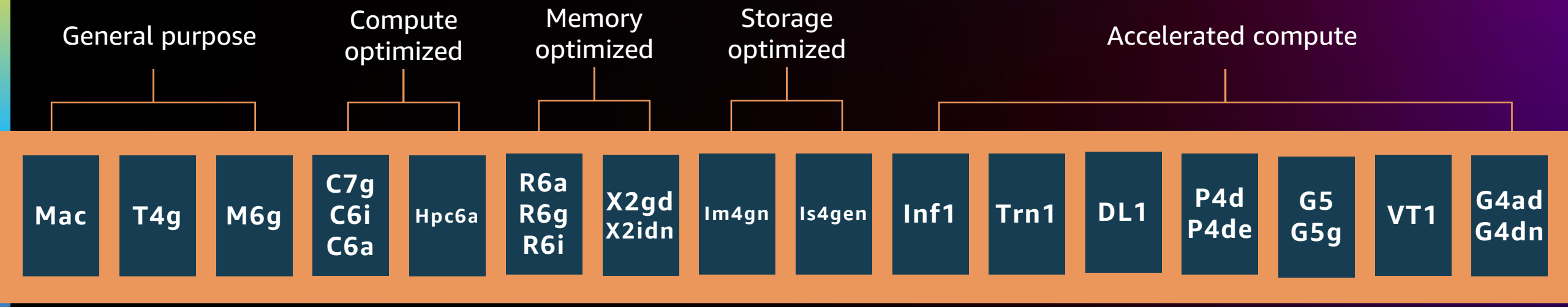
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Agenda

- Amazon EC2 instances
- Managed Amazon services
- Targeted industries and use cases
- Customer references
- Snap: 3D Bitmoji on AWS
- Mircom: Optimized unified pane of glass for smart buildings on AWS

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High-performance, cost-effective infrastructure for every workload



Intel Xeon Scalable processors
Habana Gaudi accelerators

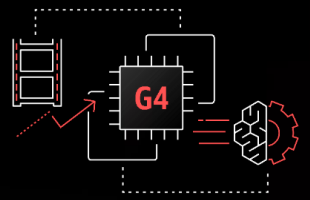
AMD EPYC processors
AMD Radeon Pro GPU
AMD Xilinx media accelerators

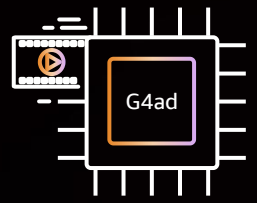
AWS Graviton processors
AWS Inferentia accelerator
AWS Trainium accelerator

NVIDIA A100 GPU
NVIDIA A10G GPU

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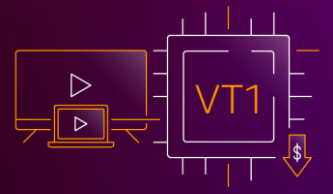
Current graphics-focused instances











G4dn	G4ad	G5	G5g	VT1
NVIDIA T4 GPUs	AMD Radeon Pro V520 GPUs	NVIDIA A10G GPUs	NVIDIA T4G GPUs	AMD Xilinx Alveo U30 media accelerator cards
16 GB of GPU memory	8 GB of GPU memory	24 GB of GPU memory	16 GB of GPU memory	16x 1080p30 concurrent transcodes
Starting at $0.526/hr*	Starting at $0.379/hr*	Starting at $1.006/hr*	Starting at $0.42/hr*	Starting at $0.65/hr*

*Prices shown are for Linux On-Demand instances in US East (N. Virginia) AWS Region

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Amazon graphics services

Remote display protocol



NICE DCV

End user computing



Amazon AppStream



Amazon WorkSpaces

Games



Amazon GameLift



AWS GameKit



Amazon GameSparks

AWS Thinkbox



AWS Thinkbox Deadline



AWS Thinkbox Krakatoa



AWS Thinkbox Frost

AWS Elemental



AWS Elemental MediaConnect



AWS Elemental MediaConvert



AWS Elemental MediaLive

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Related industries



Gaming



Architecture, engineering, and construction



Media and entertainment



Healthcare and life services



Retail



Energy

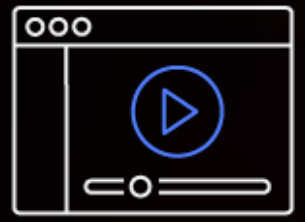
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Graphics use cases



Remote workstations



Pixel streaming



Rendering



Video transcoding

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Customer references

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ubitus



“Ubitus has leveraged AWS to release a cloud gaming version of Hitman 3. With EC2 G4ad instances, we were able to fit up to 50% more concurrent streams per instance.”

Wesley Kuo

CEO, Ubitus

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“We’re able to run professional VR/XR applications in our signature human-eye resolution with 3x the frame rate.”

Urho Konttori

Founder and CTO, Varjo

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THEOlive



“Our customers expect both ultra-low latency and high-quality video. We chose EC2 VT1 instances to transcode video without sacrificing quality while reducing costs by up to 30%.”

Steven Tielemans

CEO, THEO Technologies

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3D Bitmoji on AWS

Eli Semory
Tech Lead
Snap



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Agenda

- Bitmoji avatar evolution
- Snapchat avatars
- 3D architecture
- Using AWS GPU instances

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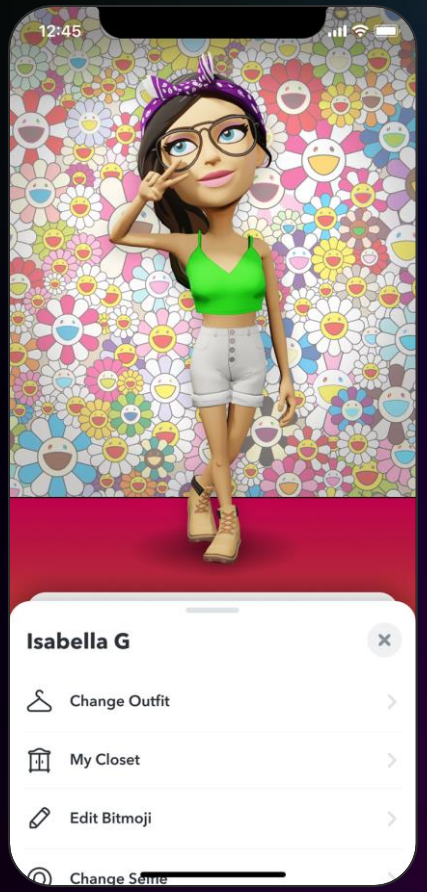
Avatar evolution

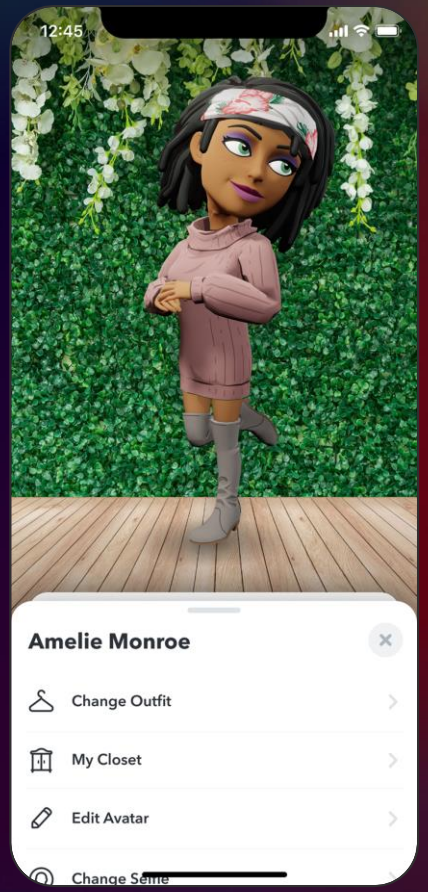


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Users’ identity



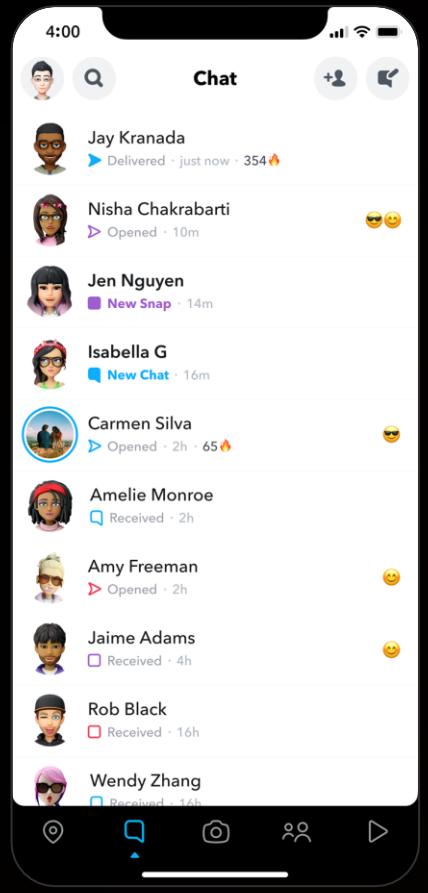


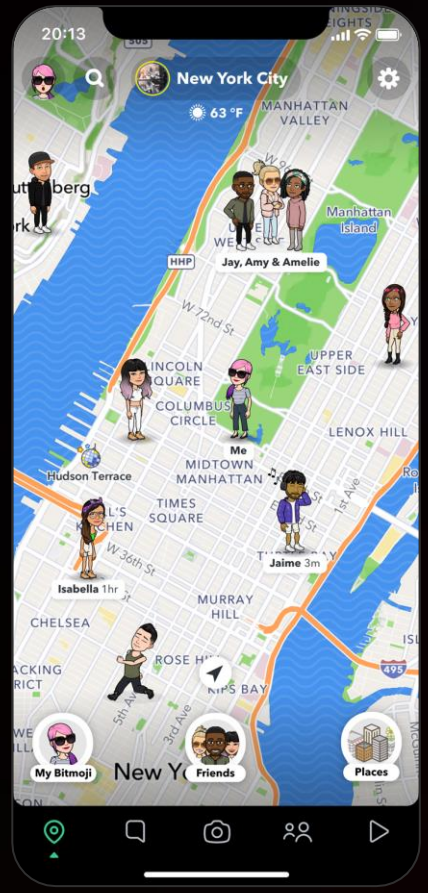




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Snapchat and Bitmoji









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Snapchat and Bitmoji usage

- **363 million** daily active users (DAUs) use Snapchat every day on average
- **250 million** people use Bitmoji every day
- **Over 1 billion** avatars created
- **Over 1 trillion** possible outfit combinations
- **Over 700 million** 3D images rendered daily



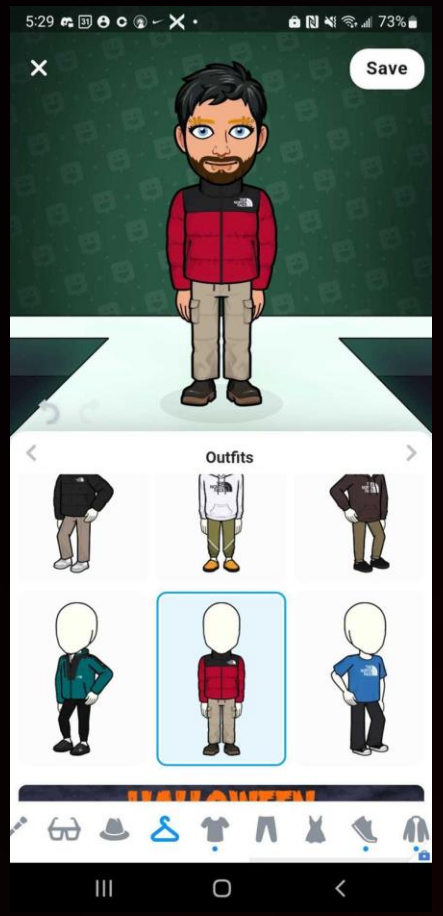
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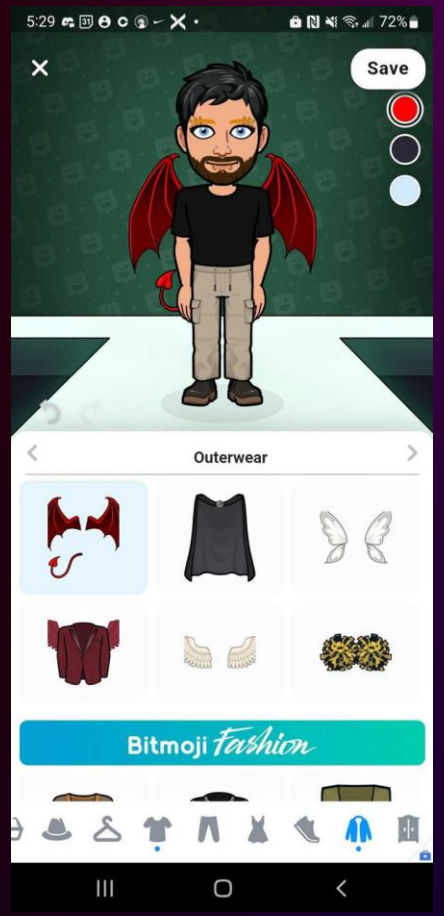
Bitmoji 3D architecture – Editor

Avatar properties based on user selection are stored on Amazon DynamoDB









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Bitmoji 3D architecture – Builder

- Assemble the avatar using selected properties
- Build a 3D mesh with a rig and the required morph targets
- Recolor all base textures
- Export to glTF and store the results on Amazon S3
- Entire process is running on Amazon EC2 GPU instances G4dn/G5
- ~1 second to generate an entire avatar

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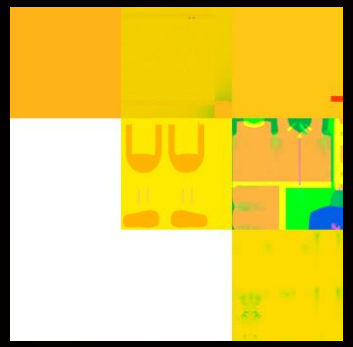
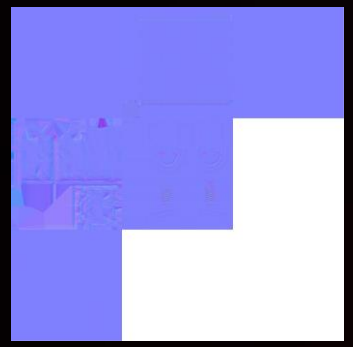
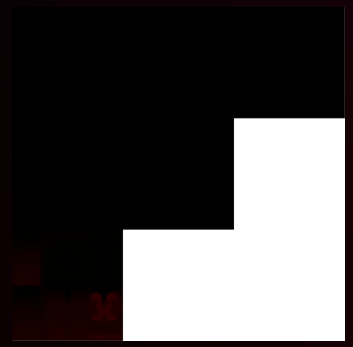
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Bitmoji 3D architecture – Model

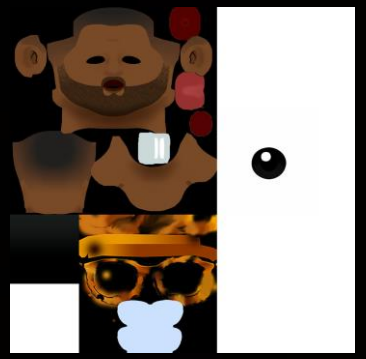
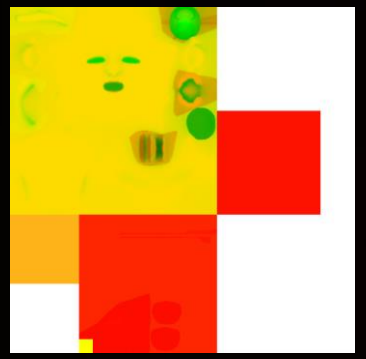
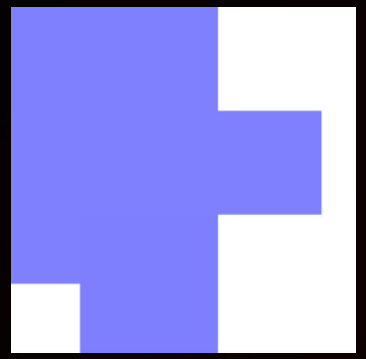
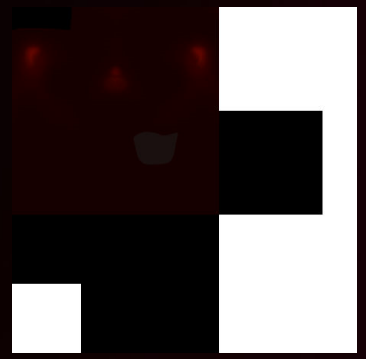


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Bitmoji 3D architecture – Texturing

Main

Face



Color ORM* Normals Emissive

*ORM = occlusion, roughness, metallic

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Bitmoji 3D architecture – Rendering

- Download the models and animations from S3
- Upload the model geometry and textures to GPU
- Render using a custom version of filament engine https://github.com/google/filament
- Running headless on EC2 G4dn/G5 GPU instances

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Bitmoji 3D architecture – Results



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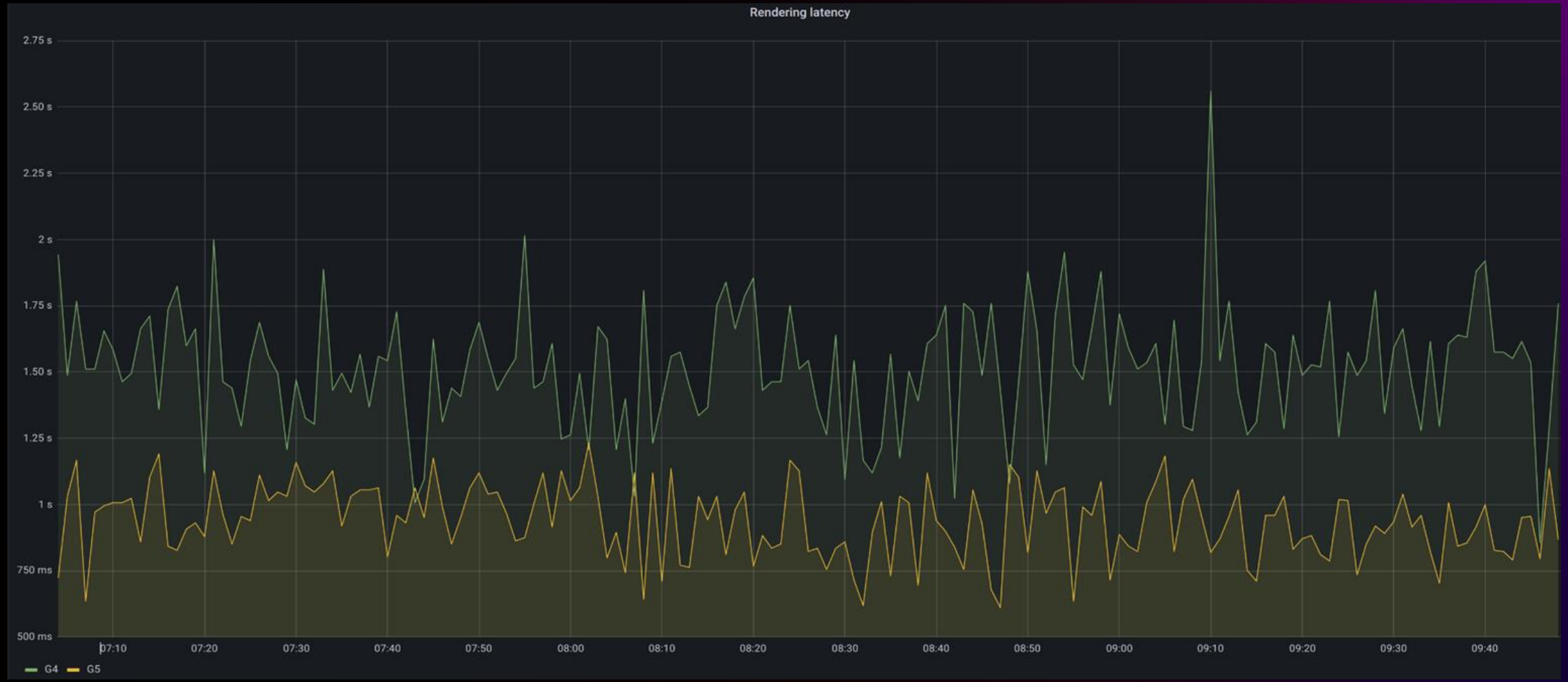
Using AWS GPU instances

- Clients requests from the app are handled by an Amazon CloudFront CDN
- Requests are forwarded to an Amazon EKS cluster
- Clusters are running on hundreds of EC2 G4dn/G5 instances (NVIDIA T4/A10G)
- Clusters can handle dynamic volumes to optimize resource utilization

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Using AWS GPU G4dn vs. G5

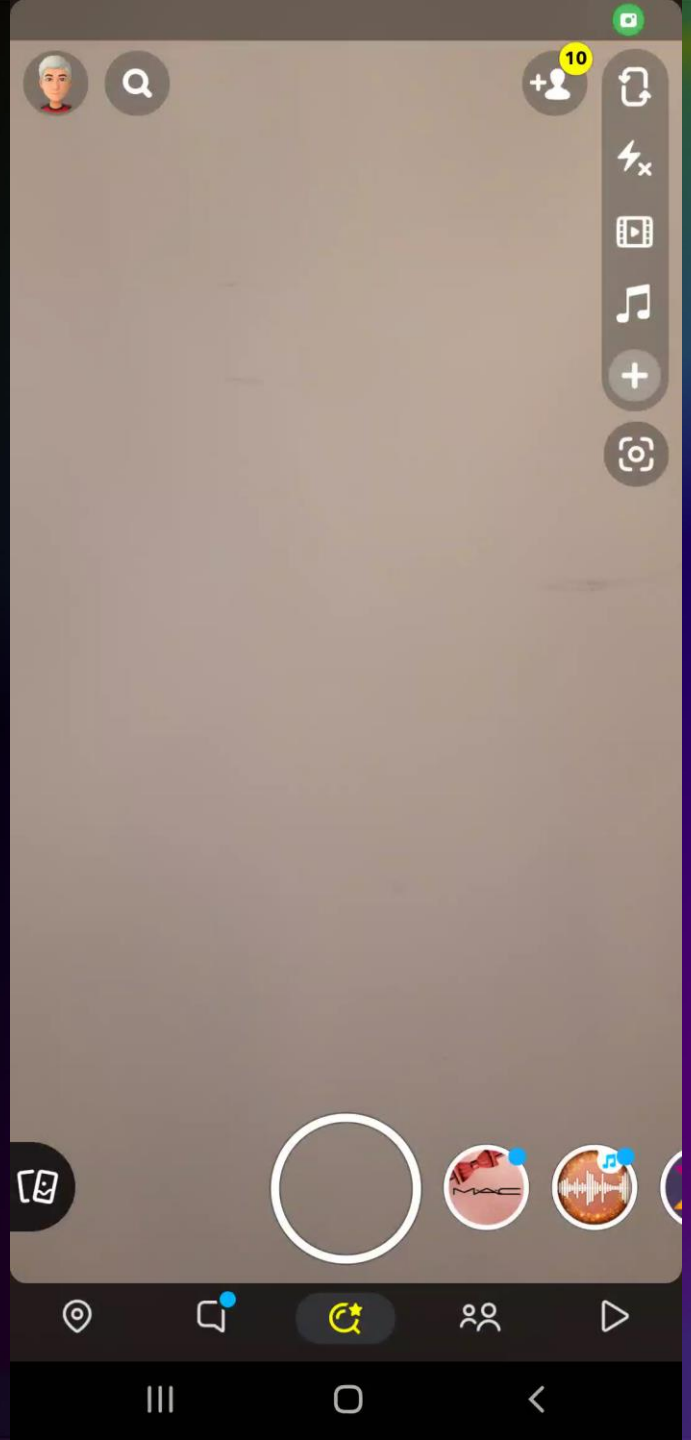
IMPROVES LATENCY BY ALMOST 50%



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Bitmoji demo

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Optimized unified pane of glass for smart buildings on AWS

Brian Leung (he/him)

Sr. Manager of Engineering
Mircom Group of Companies

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Agenda

Who we are

Where we were

Our cloud journey

Where we are today

And now, let’s watch

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Who we are

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About us



Corporate headquarters
Vaughan, Ontario, Canada

15 Canadian offices

5 USA offices

500+ employees worldwide

Mircom®

Safer • Smarter • More Livable Buildings

5 international offices

aws

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Leadership



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Safer, smarter, more livable

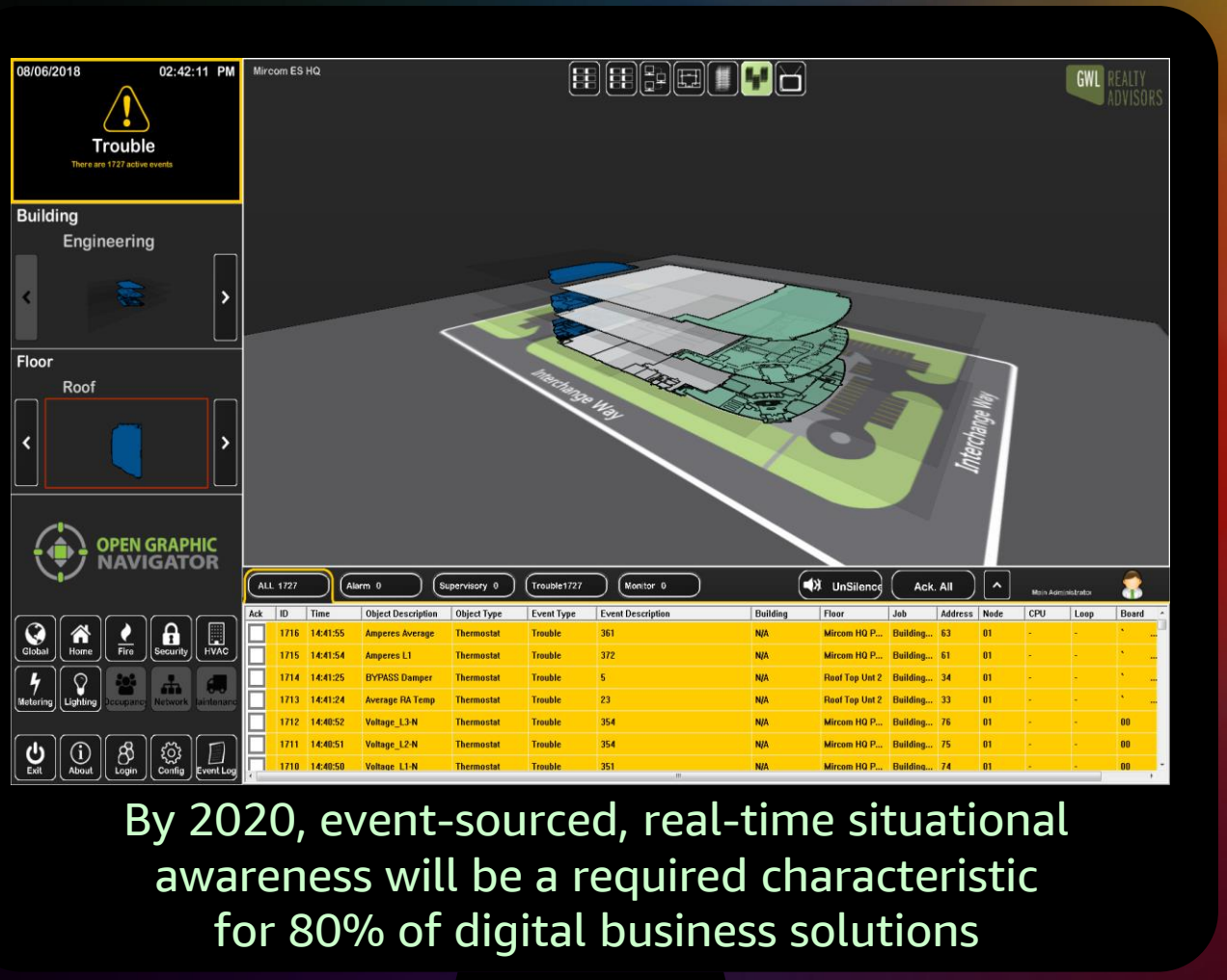


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Where we were

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Single pane of glass

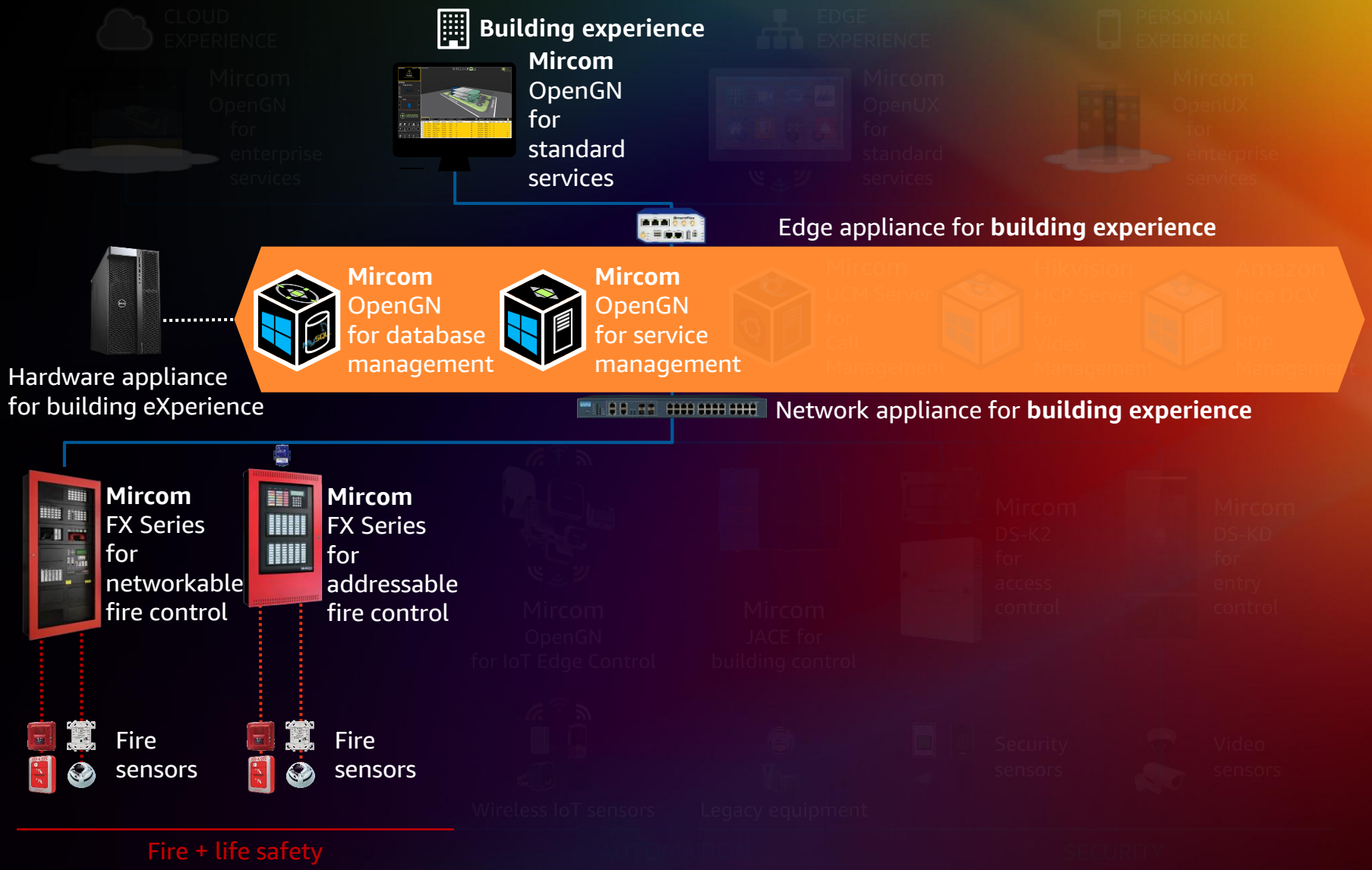


OpenGN standard

By 2020, event-sourced, real-time situational awareness will be a required characteristic for 80% of digital business solutions

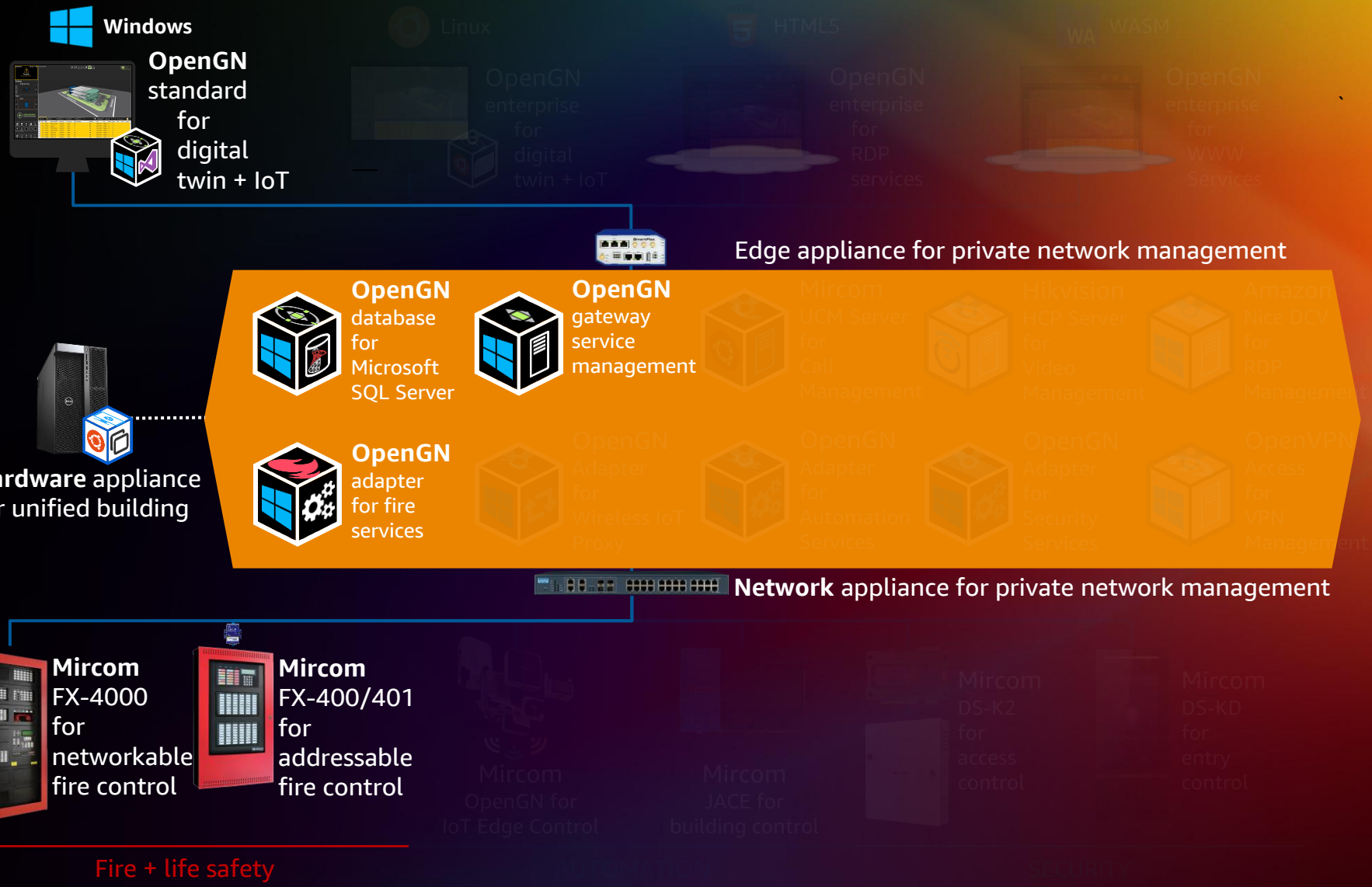
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Building eXperience



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Deeper dive

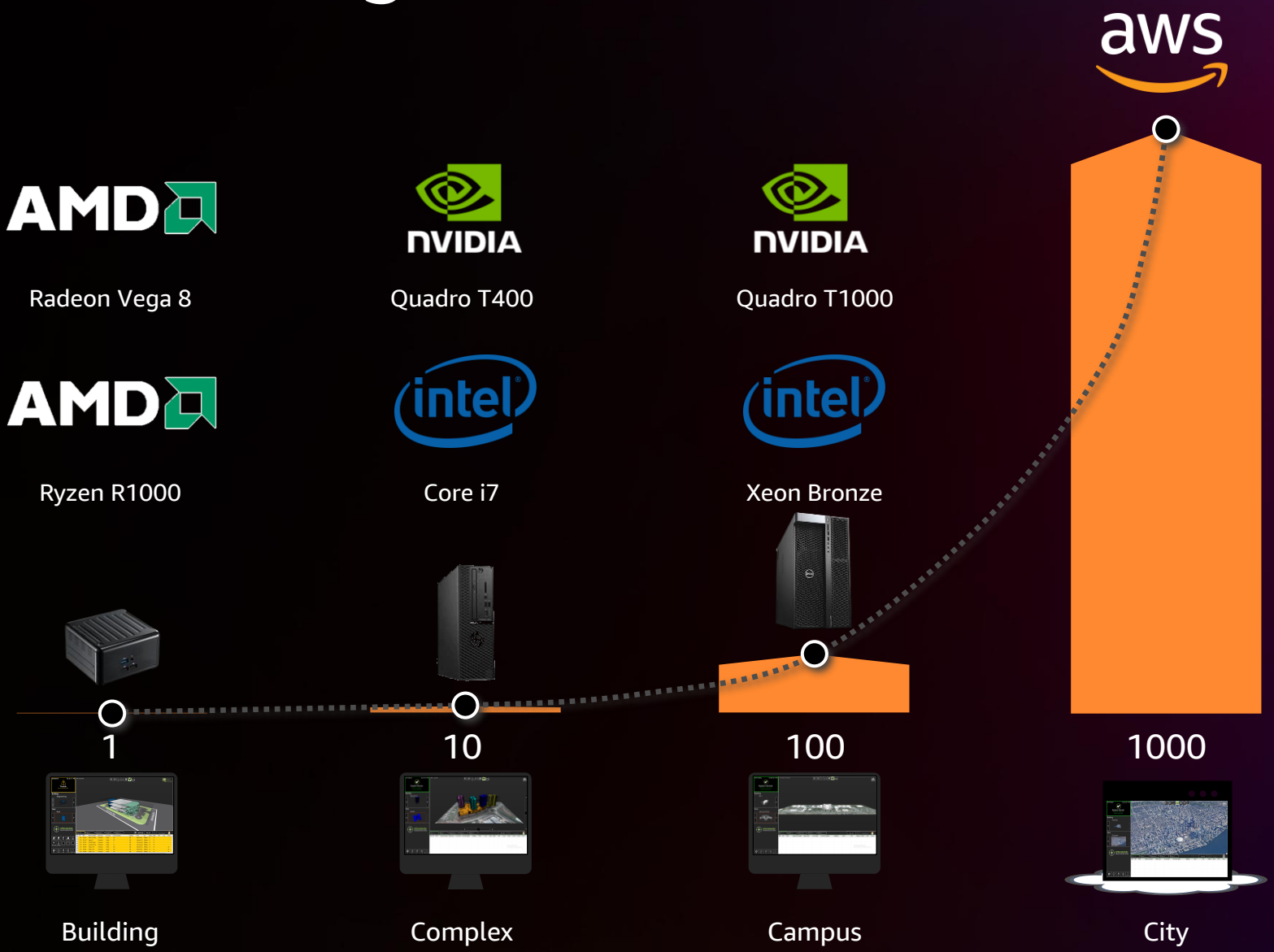


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Our cloud journey

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What the challenge was



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How we solved the challenge

Amazon EC2 G5g

And experience

Unified platform

Lower cost

Better performance

No cost

No cost



Cloud

OpenGL 3.0

AWS Graviton2

T4G Tensor

Ubuntu 18.04

MySQL 8.0



Building

OpenGL 1.0

Core/Xeon

Quadro T400/1000

Windows 10

SQL Server 2017

Experiences

Platforms

Compute

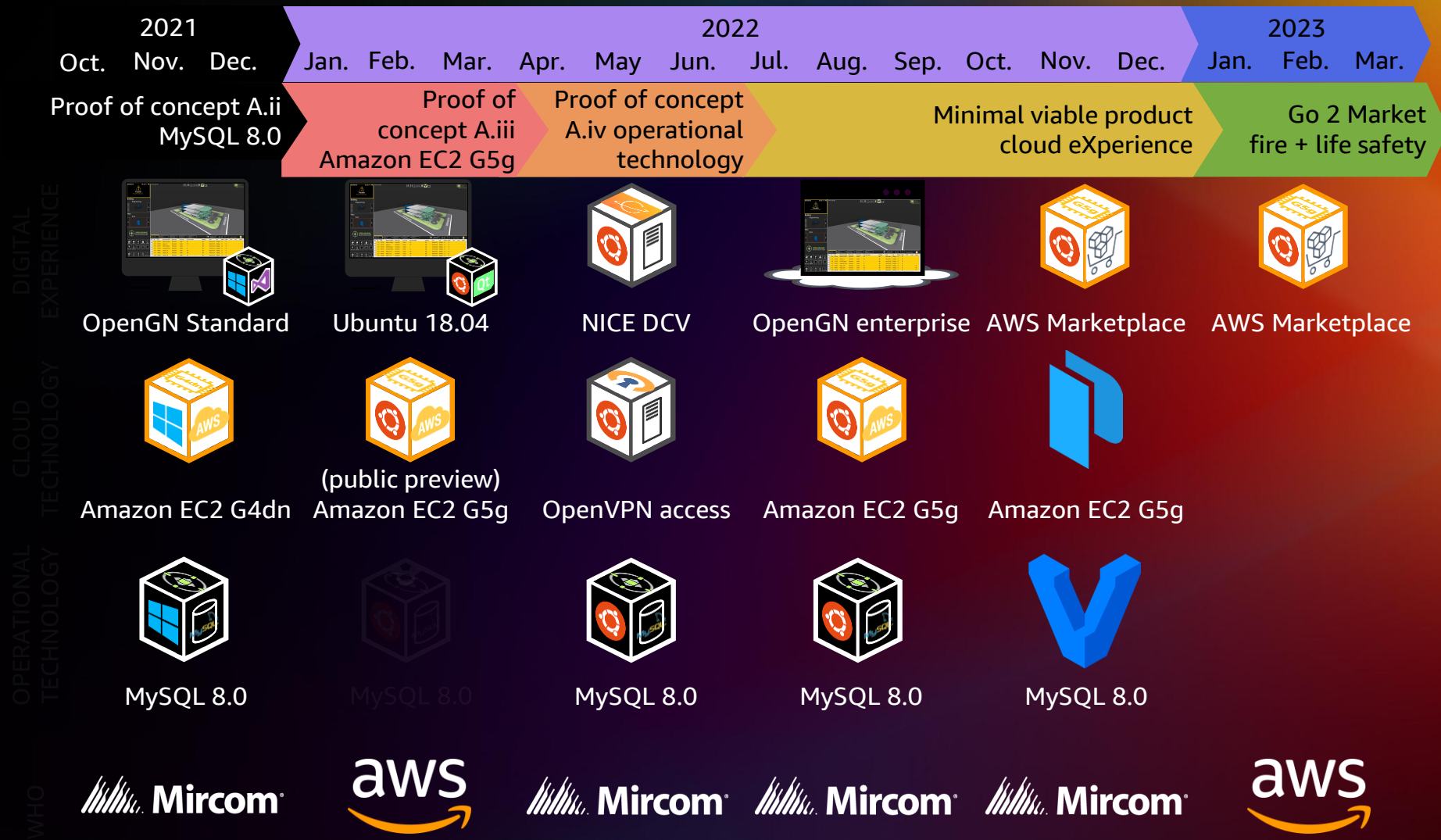
Graphics

Operating system

Database

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Our roadmap to the solution

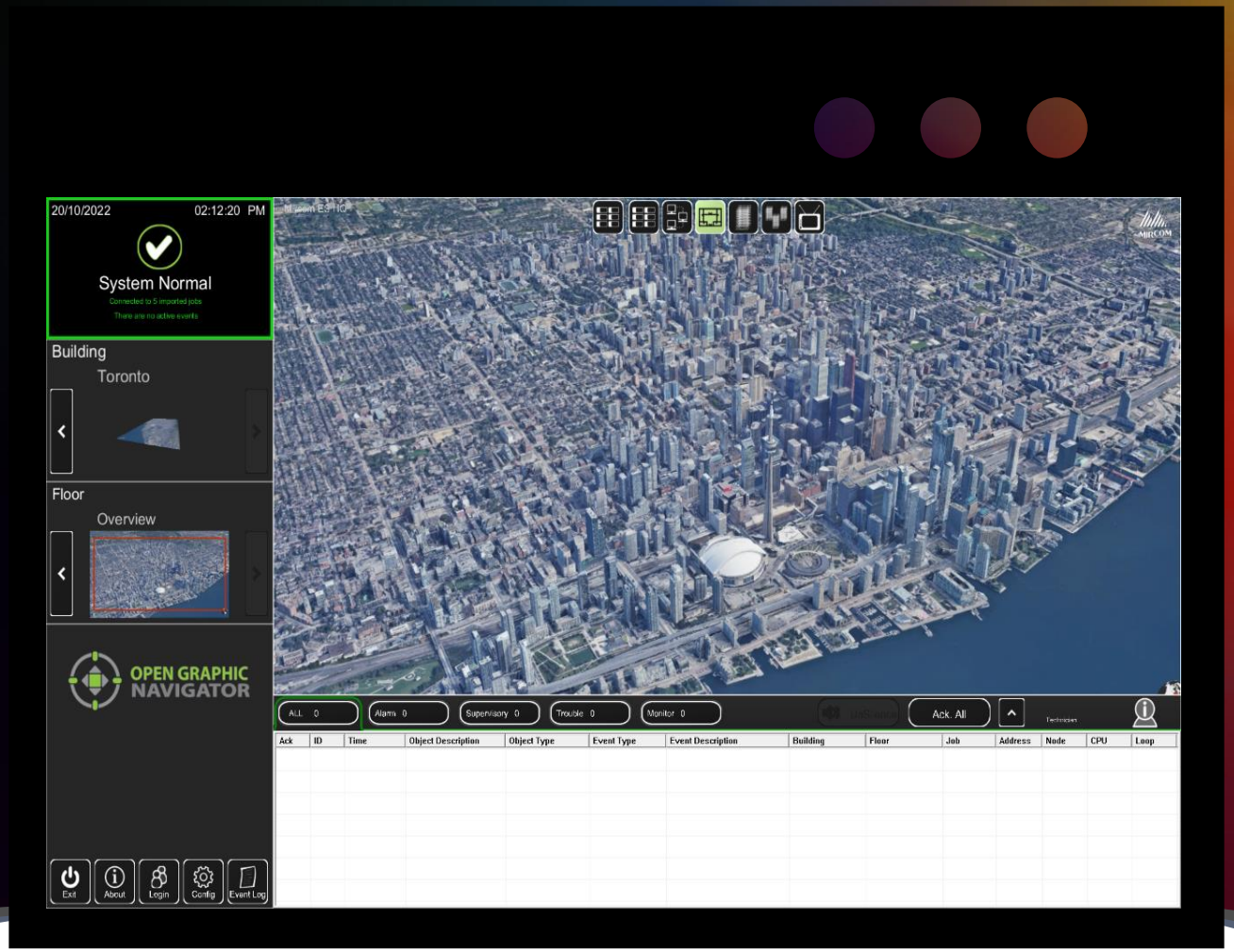


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Where we are today

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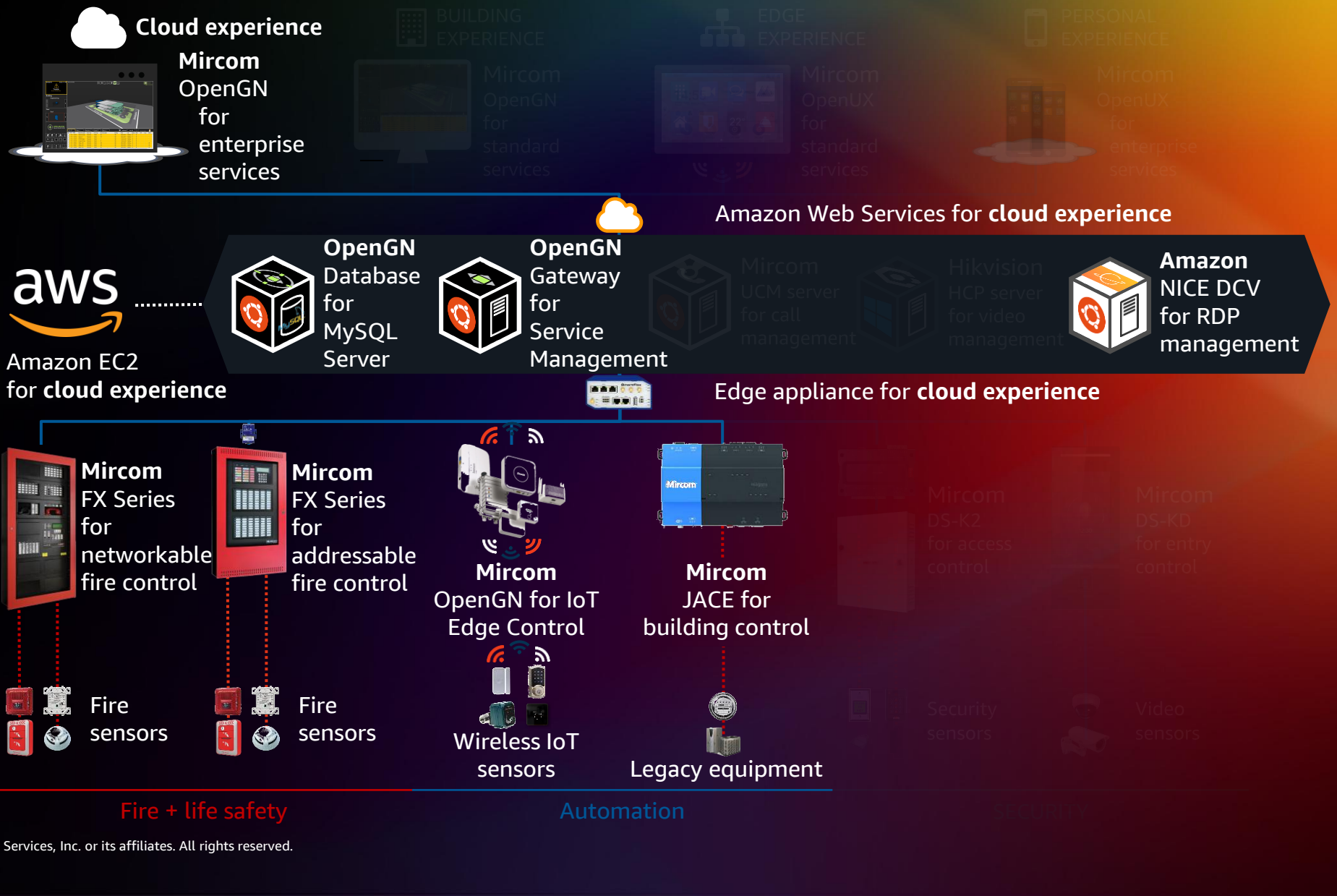
Unified pane of glass



OpenGN enterprise

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Cloud eXperience



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Deeper dive



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And now, let’s watch

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Thank you!

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