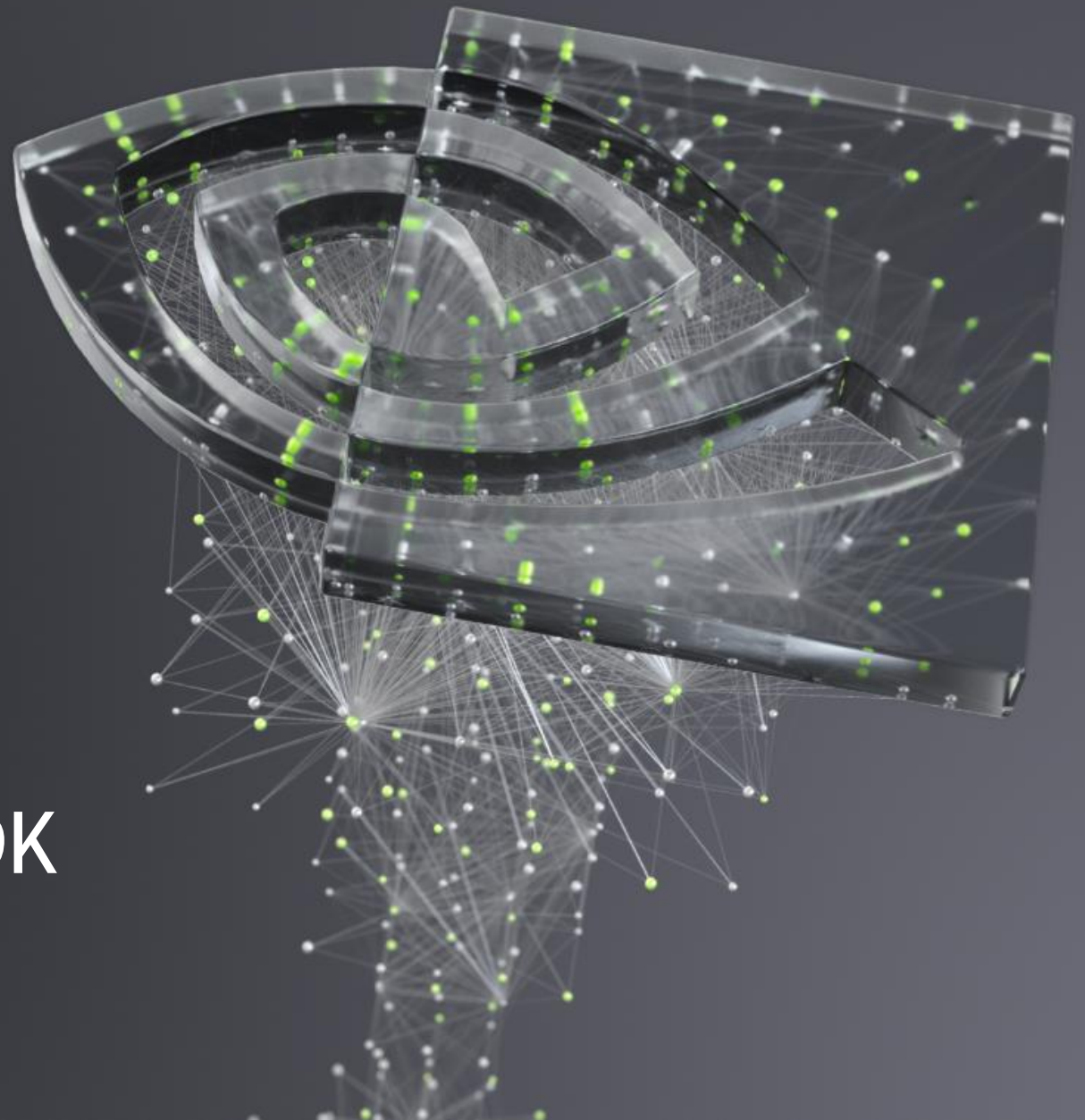


NVIDIA

NVIDIA CLOUDXR™ SDK

QUADRO PROFESSIONAL VR/AR/MR

FUNDAMENTAL XR GRAPHICS CHALLENGES

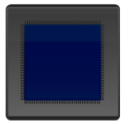
Very High Pixel Rendering Throughput

TRADITIONAL = 60 MP/S
(1920 X 1080 @ 30 FPS)

VIRTUAL REALITY = 450 MP/S
(3024 X 1680 @ 90 FPS)*

Maintaining Very Low Latency

HMD updates pose



CPU triggers redraw

GPU computes new image

HMD flashes display

Motion to Photon: ≤ 20 ms

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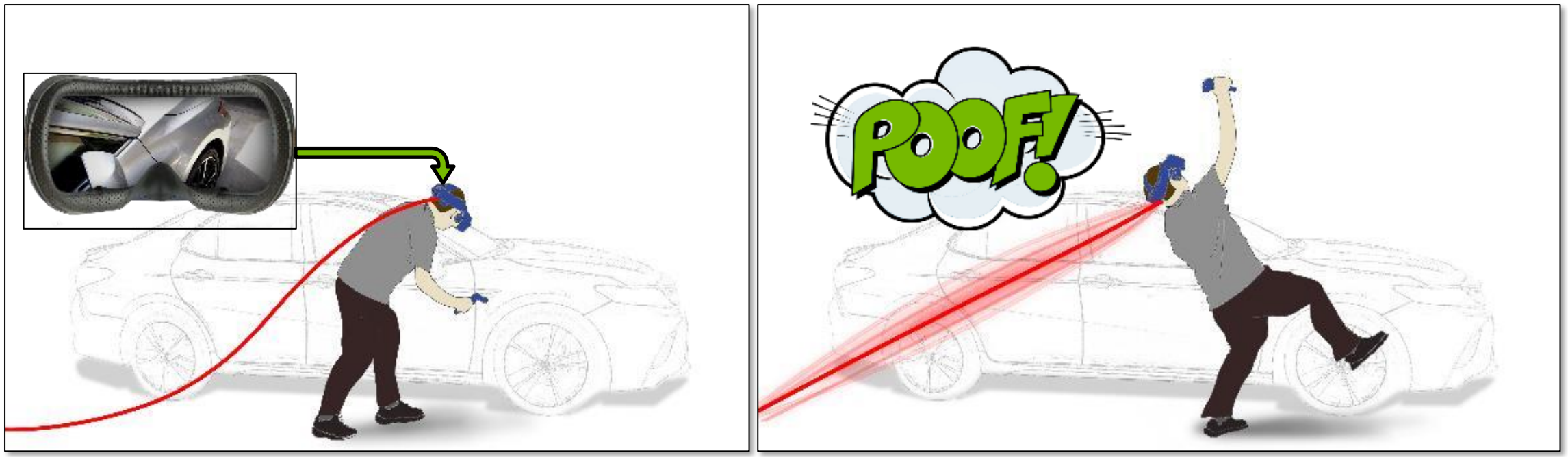
LIMITATIONS OF A TETHERED EXPERIENCE

In Product Design

In Virtual Production

In Media & Entertainment

CONSTRAINING THE MAGIC SPELL OF XR



Limits Mobility | Breaks Immersion | Interrupts Creativity | Potential Safety Concerns

COLLABORATION AND TETHERS

Limiting Collaborative Workflows

TRADITIONAL TRADE OFF WITH AIO DEVICES

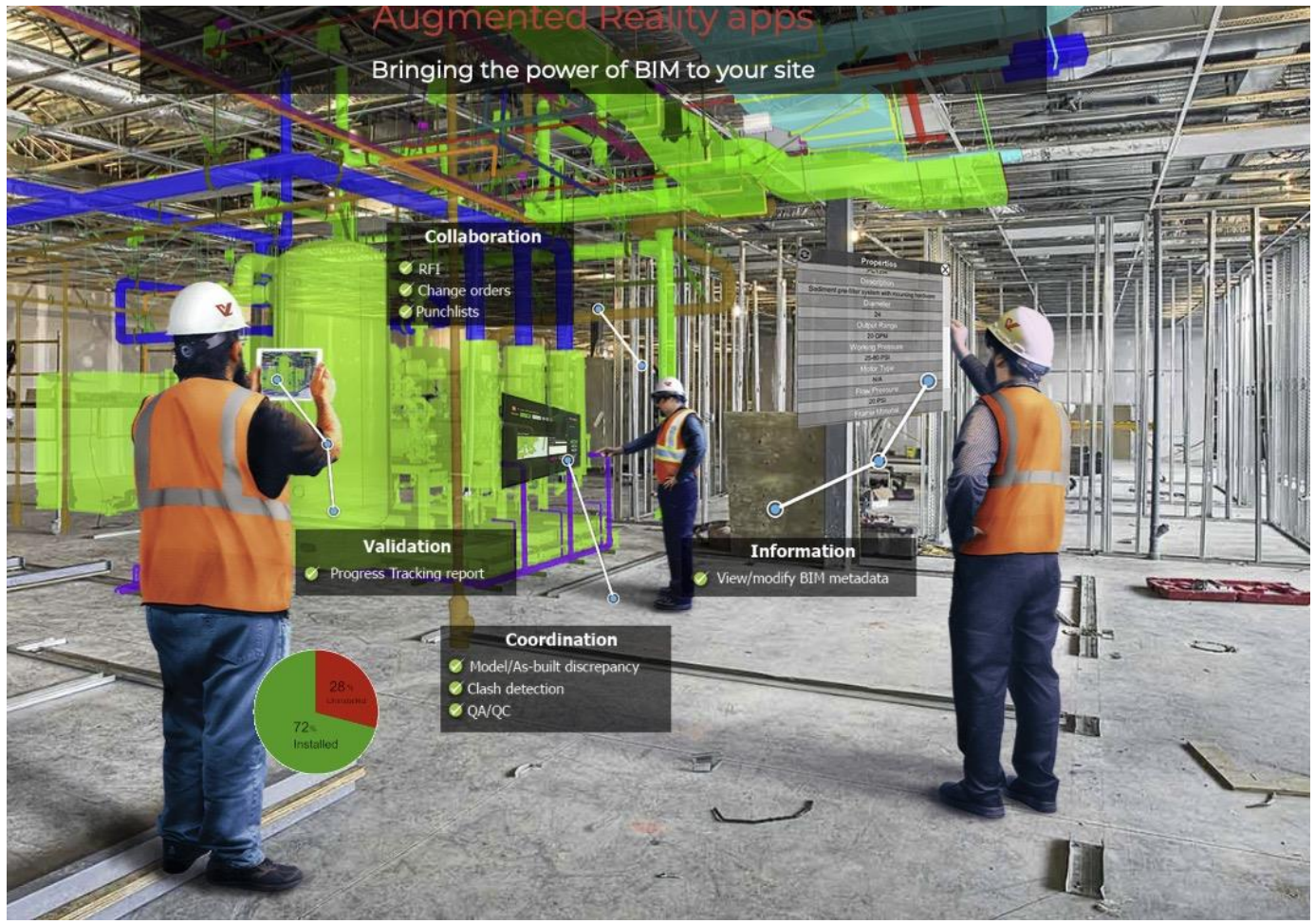
Limitations

- Limited Processing Power
- Insufficient Memory for Enterprise Datasets
- Low-Fidelity Graphics

Mobile Freedom

AR IN CONSTRUCTION

- Showcase Mechanical Systems BIM Model
- Showcase Electrical Systems BIM Model
- Install Validation - QA/QC



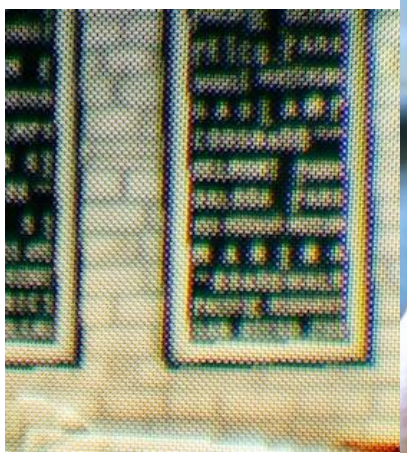
ENTERPRISES NEED THE BEST OF BOTH WORLDS

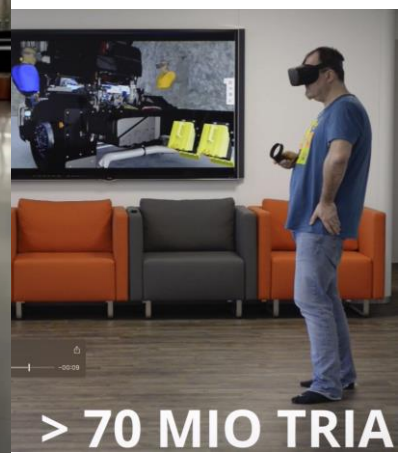
Highest Quality Graphics

Mobile Freedom

EVOLVING XR WORKLOADS

Resolutions, Data size, Collaboration, AI, and Perception





Resolutions w ion is a must

WILL DEMAND NETWORK DELIVERED XR

THE FUTURE OF XR: NVIDIA CLOUDXR

Stream High-Fidelity AR/VR to Any End Device

Leverage High-Bandwidth & Low-Latency of 5G

Get Maximum Compute/Rendering Power with Quadro RTX GPUs

Telco-Grade Manageability, Security & Multi-Tenancy with Quadro vDWS

CLOUDXR VISION

XR Streaming to Any Device

RTX Servers

Network

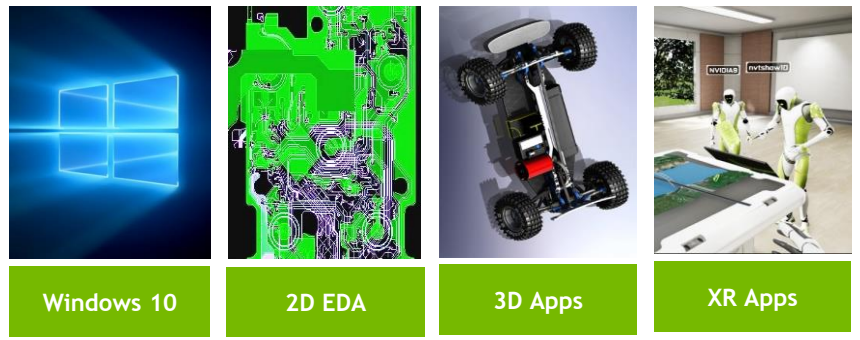
XR Clients

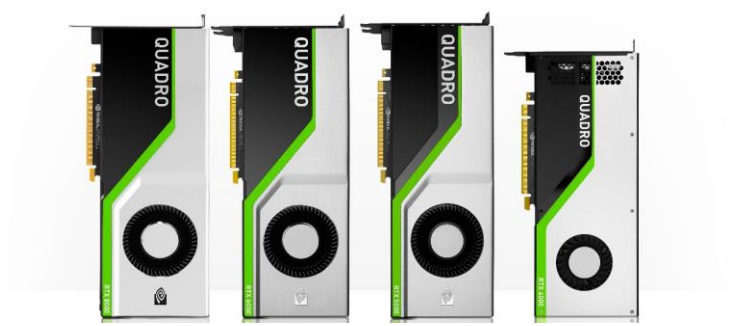
EXTENDING MIXED WORKLOADS WITH NVIDIA vGPU

Increase productivity & utilization, decrease costs

CloudXR Extends QvDWS

- Brings XR to virtualized environment
- Two users per RTX6000/8000 reduces TCO for XR worloads
- Furthers the ease of use

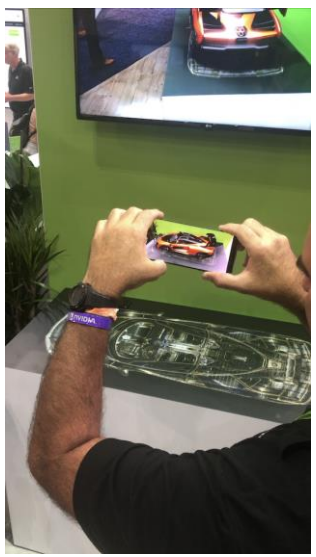


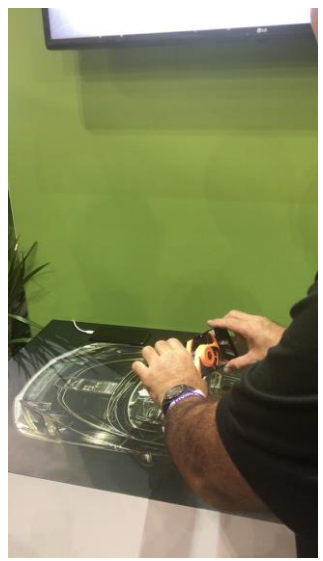


vmware® | THEGRIDFACTORY |

RTX INTERACTIVE GRAPHICS ON MOBILE DEVICES

Photoreal and Immersive Using Edge Compute





ARCHITECTURE OVERVIEW

Server-Side Driver, Client-Side Application and SDK

audio, video, haptics →

← *pose, control inputs, video*

VR App

OpenVR Runtime (Valve)

Virtual HMD Driver | **Virtual Audio Driver**

Video Encoder | **Audio Encoder**

Cloud

SERVER driver (Nvidia)

Network

HMD

Late & Lens Warp

VR Runtime

Video Decoder | **Audio Decoder**

Cloud

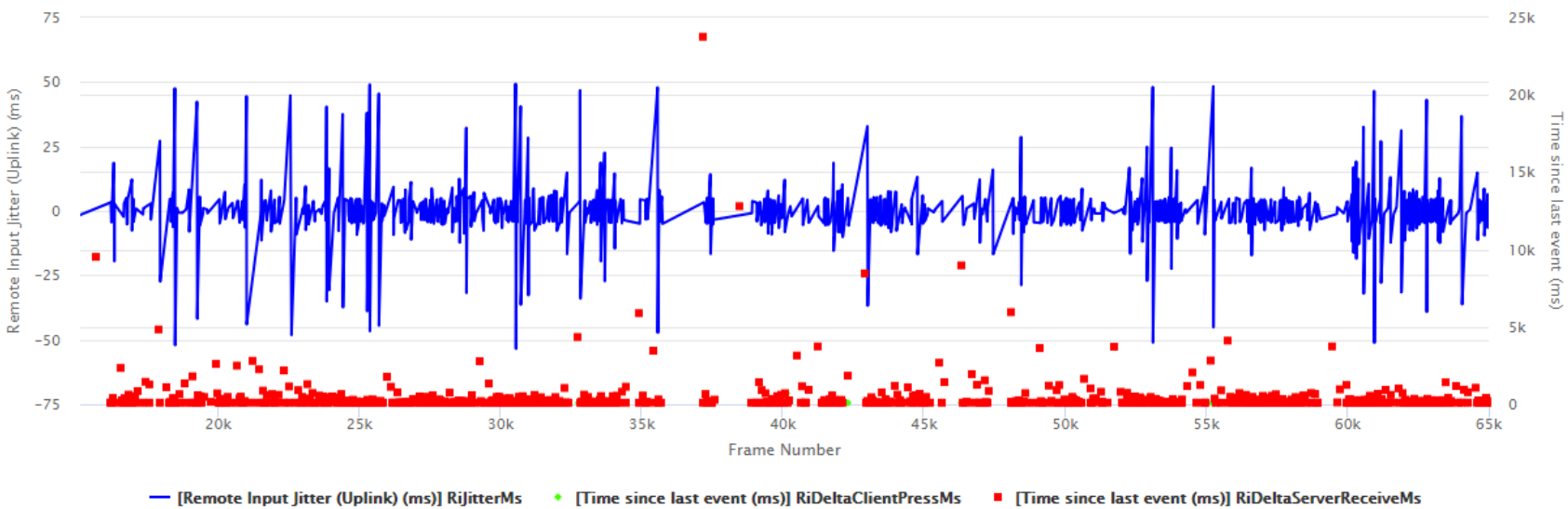
CLIENT app (Nvidia)

QOS

Reliability & Resilience

Relevant Internet problems:

- Jitter
- Missed packets
- Bandwidth variation



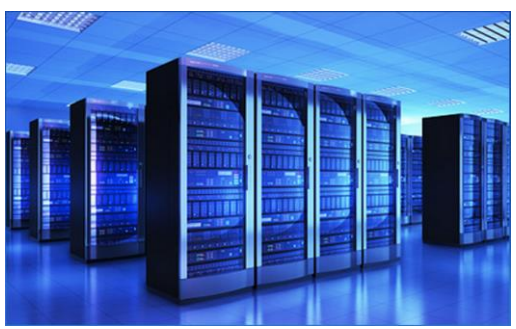
QOS

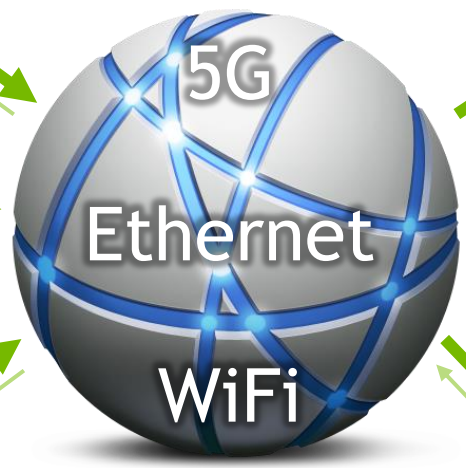
Reliability & Resilience

Challenges	Solutions	Control parameters
Latency	Custom HEVC profile	NVENC knobs
Jitter	De-jitter buffer	Buffer size
Missed packets	Forward error correction	Correction strength
Bandwidth variation	Video compression	Compression rate

CLOUDXR CONFIGURATIONS

Total Flexibility





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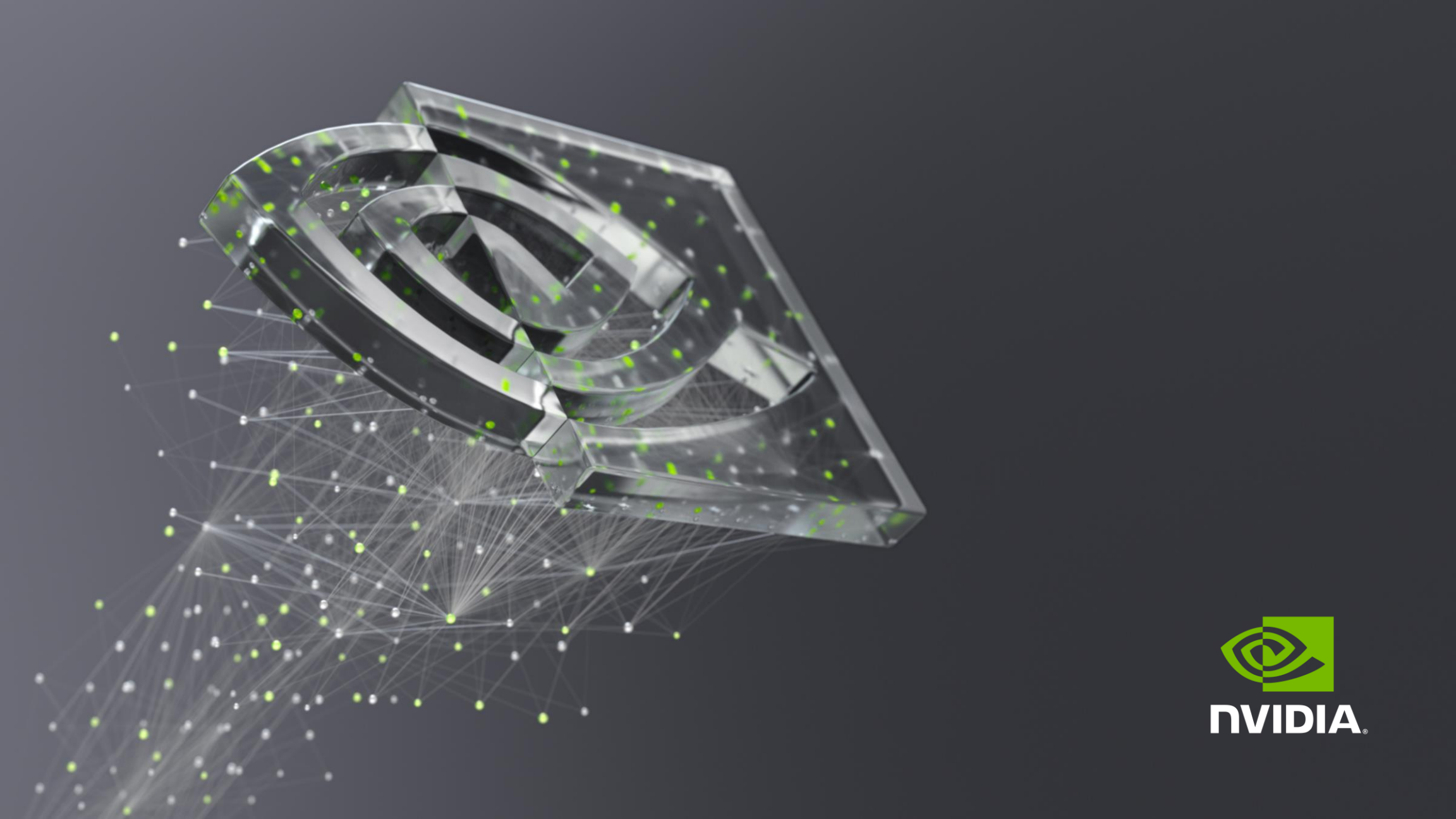
NVIDIA CLOUDXR 1.0

Stream AR/VR Over High Performance Networks with CloudXR

- Stream High-Fidelity AR/VR to Any End Device
- Scalability with Quadro vDWS
- Maximum Graphics Power with Quadro RTX GPUs
- Any OpenVR app. can now be a streaming VR and AR application

- For More Information and to Apply to the Registered Download Go To: http://www.nvidia.com/cloudxr
- Or Contact Greg Jones: gjones@nvidia.com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