TEAMRGE EVENT 2024 WHERE FUTURE OF END USER COMPUTING MEETS REALITY

10+ community sessions around GPUs, VDI, DaaS, DEX, Remoting Protocols and AI



15th February 2024 16:00 CEST / 10:00AM EDT / 07:00AM PDT

Register Now

www.teamrge.com/events

This FREE community event is made possible with support of:











Dr. Benny Tritsch

Managing Director at

Dr. Tritsch IT Consulting

Joe DaSilva PMTS, Solutions Architect, Cloud Graphics at AMD



Johan van Amersfoort Technologist EUC & Al M at ITQ

Bram Wolfs

Consultant at

Wolfs IT Solutions



Eltjo van Gulik

Principal Product Manager

for HDX Graphics & Seamless at Citrix

Magnar Johnson Manager | Solution Architect Sopra Steria



Rody Kossen Senior Principal Quality Engineer at Citrix



Ruben Spruijt Field CTO at Dizzion



Ryan Ververs-Bijkerk Technical Evangelist at GO-INIT



Shawn Bass
Start-up advisor and
former EUC CTO of Desktop
Technologies at VMware

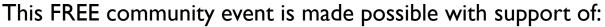


Thomas Poppelgaard Independent Consultant and Technology Evangelist at Poppelgaard.com



RUBEN'S DEEP DAAS ANALYSIS IN AZURE, AWS, AND GCP UNDERSTANDING PERFORMANCE AND PRICE – 2024 EDITION













AGENDA

- I. System Performance / User Experience
- 2. Overview of Applications and Tools used
- 3. Performance and Costs "CloudPC" w/o GPU
- 4. Performance and Costs "Cloud Workstation" w/ GPU and various GPU applications
- 5. Performance and Costs "Cloud Workstation" w/ GPU and various AEC applications
- 6. "40 studies"









WHY



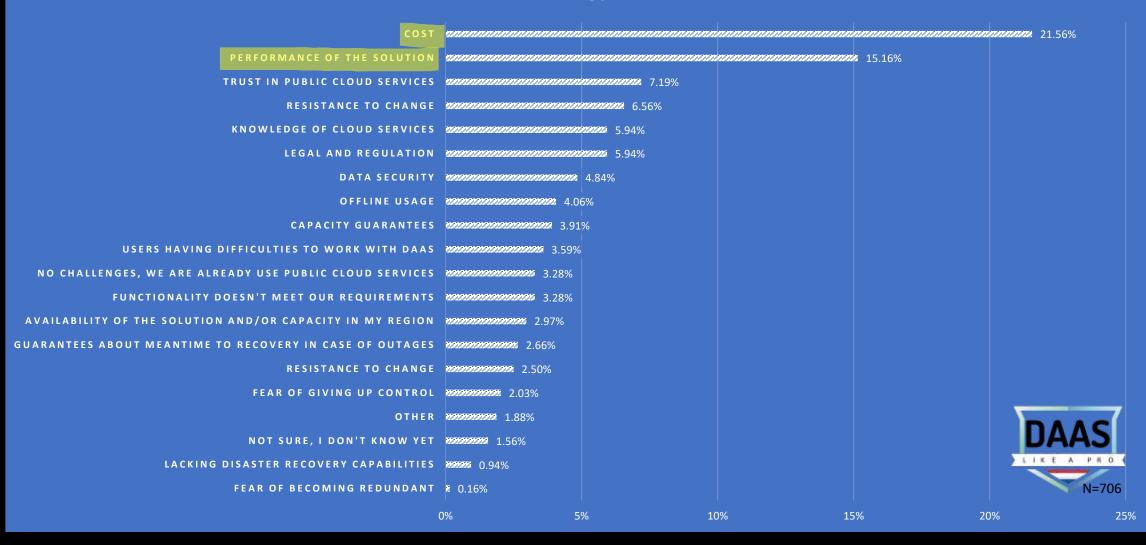
- How do the performance and cost-effectiveness of DaaS instances on AWS, Azure, and GCP compare?
- Analyzing User Experience: A Comparison between Physical Workstations, On-Premises Remote Desktops, and Cloud-Based Desktops!





LIKE A PRO

WHAT ARE THE BIGGEST CHALLENGES IN YOUR ORGANIZATION CAUSED BY USING OR ADOPTING DAAS?





CPU-Z CineBench Crystal Disk Mark Blender BenchMark CPU/GPU **EUC Score IOMeter EUX Score – Login Enterprise SPEC 2020**

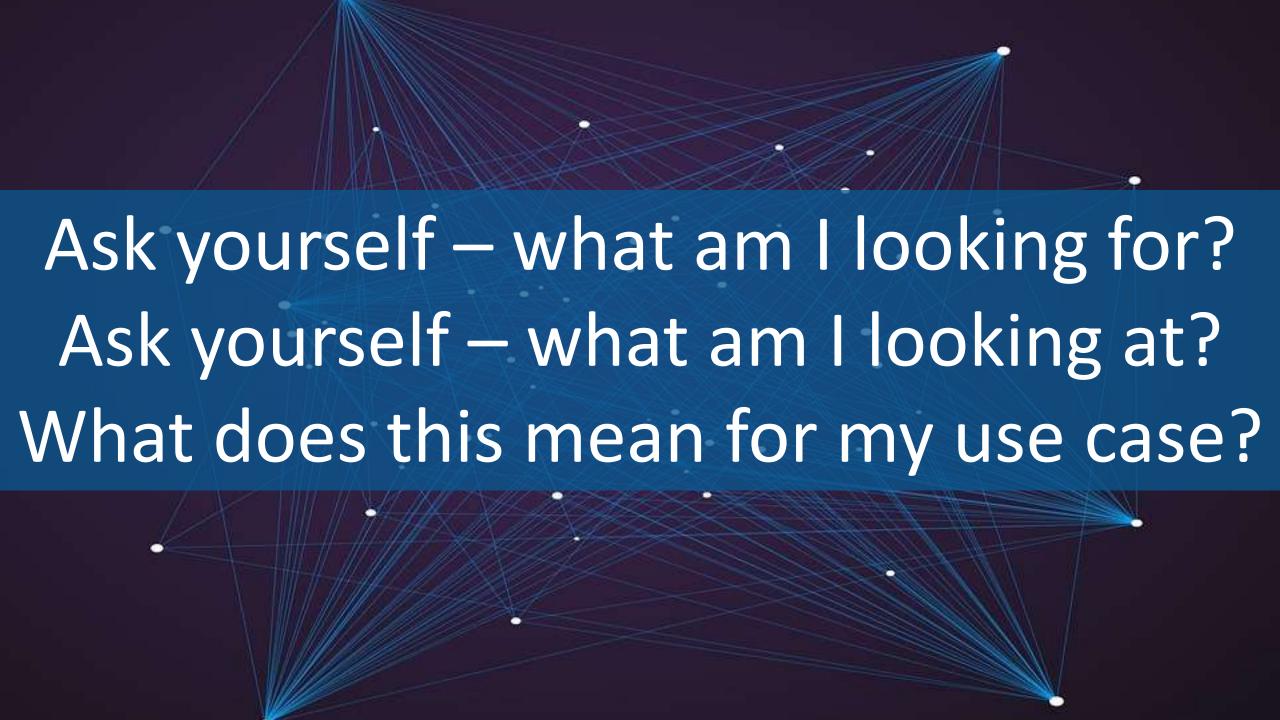
Enscape **Autodesk Inventor Autodesk Revit Autodesk VRED** Unreal Engine vRay KeyShot MacroRecorder





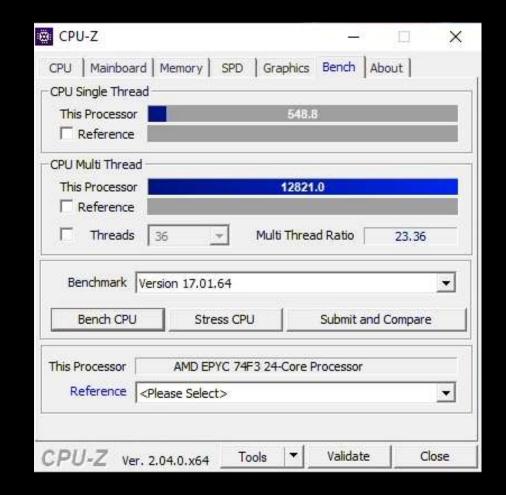
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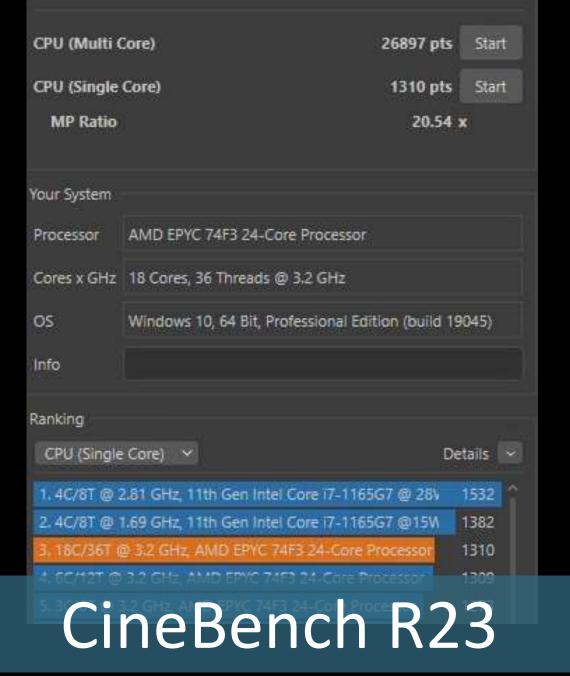






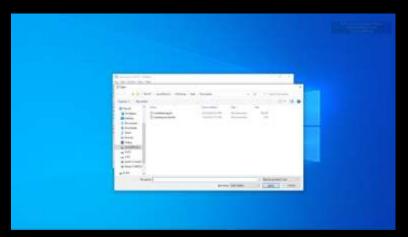


CPU-Z

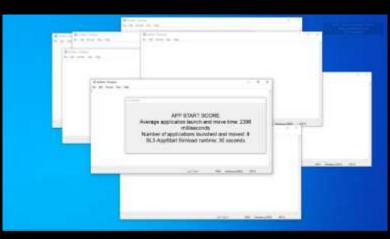


```
EuxRunner.exe - Shortcut
RUN LocalAppdata: C:\Tools\EUX2023\DiskSpeed.exe folder="C:\Users\Frame\AppData\Local\eux2023" blockSize=50k bufferSize ^
=4K writeMask=0x0C0C cachePct=95 latencyPct=95 threads=1 duration=1000
New measurement: diskappdata latency = 55555
New measurement: diskappdata = 54535
RUN CPU: C:\Tools\EUX2023\CpuSpeed.exe d=1000 t=2
New measurement: cpuspeed = 100864
RUN Compression: C:\Tools\EUX2023\CompressionSpeed.exe folder="C:\Users\Frame\Documents\eux2023" cachePct=25 writePct=35
 duration=1000 threads=1 -high
New measurement: highcompression = 1763
RUN CachedHighCompression: C:\Tools\EUX2023\CompressionSpeed.exe folder="C:\Users\Frame\Documents\eux2023" cachePct=25 w
ritePct=35 duration=1000 threads=1
New measurement: fastcompression = 2064
RUN App: C:\Tools\EUX2023\AppSpeed.exe folder="C:\Users\Frame\Documents\eux2023" duration=10000 launchtimestamp=27468157
833
New measurement: appspeed userinput = 904
New measurement: appspeed = 9523
diskmydocs latency score: 9.30, result = 3636.36 (20000.00)
diskmydocs score: 9.16, result = 2909.84 (24733.67)
diskappdata latency score: 9.78, result = 7671.90 (53703.33)
diskappdata score: 9.30, result = 3669.40 (51371.67)
cpuspeed score: 8.76, result = 2018.81 (100940.67)
highcompression score: 7.13, result = 875.73 (2189.33)
fastcompression score: 6.69, result = 730.67 (1826.67)
appspeed userinput score: 8.51, result = 1809.33 (904.67)
appspeed score: 9.30, result = 3696.00 (9240.00)
Weight 1 of highcompression is converted to 1.15 because of score 7.13 (correction = 1.15)
Weight 1 of fastcompression is converted to 1.34 because of score 6.69 (correction = 1.34)
EUX2022 = 8.40
Drace any key to close this window
```

Login Enterprise - EUX Score



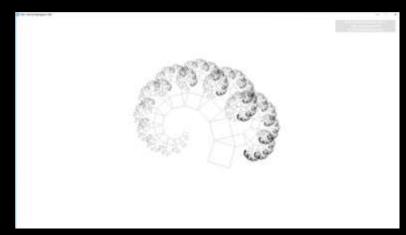
SL3-AppDialog



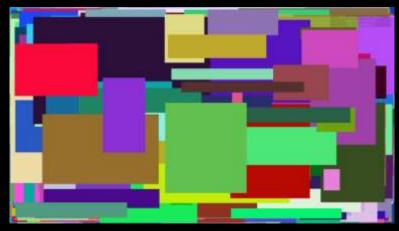
SL3-AppStart



SL3-FractalsDragon



SL3-FractalsPythagorasTree



SL3-GDIPlusRect



SL3-IOPS

EUC Score – Score Simloads

CPU INSTANCE PERFORMANCE & COSTS

1		CPU	Max CPU	l.				1						i i												1 1		EUC-	
		Bose	Speed -																				Price	0.0000000000000000000000000000000000000				Score-	EUX
Paragraphic Company of the Company o		Clock	single-				Storage	COLUMN TO SERVICE STREET	GPU			1000		CBR23	CBR23 -				EUC Score			1000000	100000	CPU-Perf		EUX Score	CPU-Peri		Scorn
Instance	CPU	Speed	core	VCPU:	RAM	Storage Type	Size	GPU	RAM	Display	05	ST	MT	MC	sc	2023	AppDialog	App Start	GDI+ Dragon	Tree	Rectangles	IOPS		/Price	CPU /Price	/Price	/Price	/Price	/Price
Microsoft Azuru											ruhen@hu.ne	_								TO MODELLO					ILlien@fra.e		Nort	nalized perf	A ACCUMENT
	Intel Xeon 8272 - Cascade Lake	+ 6 000	3.2016	15	Tacin.	Premium-SSD	largen	N/A	8076	FHD	Win10 22H2	241.1	427.2	400	N/A	Service 1	0.54	10.75	2.00	nthengths.		7.03	0.21	1837	36.19	35.10	50.17	60.64	61.88
Azure D2s v3 Azure D4s v3	Intel Xeon 8272 - Cascade Lake	-	-		- Company of the last	Premium-SSD Premium-SSD	-	N/A	1.04	FHD	Win10 22H2	250.7	100000000000000000000000000000000000000		659	7.85	0.31	0.72	5,68	9.52	6,44	7.82 6.4	0.21	1886	10.52	18,69	51:49	17.63	32.96
		-		-	-		100000000000000000000000000000000000000	1000	-	FHD	Win10 22H2	12000000	-			-		-	3.27	5,57	3.28			100000000000000000000000000000000000000	21.58	-	the state of the s	36.15	72.56
Azure D2s_v5	The state of the s		3.5 GHz	100	-	Premium-SSD	10000	N/A	-			323.4	-	-	N/A	8.23	0.35	0.63	3.12	5.51	3.58	7.62	0.20	3588		41.15	97.98		
Azure D2s_v5	The state of the s	PARTICULAR 1	3.5 GHz	-	- Continue	Standard-SSO	-	N/A		FHD	Win10 22H2	308.9	THE RESERVE AND	1216	N/A	7.38	0.33	0.67	3.36	5.06	3.28	10.96	0.20	3492	21.05	36.90	95,35	35.27	65.06
Azure D4s_v5	The state of the s	No. 10, 10, 11, 16	3.5 GHz			Premium-SSD	1000000	N/A	-	FHD	Win10 22H2	1000	1101	2724	1055	8.03	0.3	0.61	1.83	3.31	1.36	6.64	0.41	3443	6,27	19.50	94,03	10.50	34.53
Azure D4s_v5	Intel Xeon 8370C - IceLake	2.8 GHz	3.5 GHz	4	16 GrB	Standard-SSD	256GB	N/A	N/A	FHD	Win10 22H2	390	1092	2521	960	6.87	0.29	0.59	2.02	3.33	1.55	9.03	0.41	3254	6.52	16.76	88.88	10.93	29.54
AWS											reduced from the									rabon@nu	tra a		1		ruben@fra.e			ratement ha	.mx
AW5 t3.medium	Intel Xeon 8259 - Cascade Lake	2.5 GHz	3.5 GHz	2	4 GiB	EBS GP3	10000	N/A	N/A	FHD	Server 2019	208.2	196.6	773	N/A	7.94	0.36	0.65	5.48	8.72	6.41	9:47	0.14	3280	50.71	56,71	89.59	84.97	100.00
AWS t3.large	Intel Xeon 8259 - Cascade Lake	2.5 GHz	3.5 GHz	2	8 GIB	EBS GP3	256GB	N/A	N/A	FHD	Server 2019	222.8	425.8	594	N/A	7.92	0.34	0.62	5.18	8.77	7.12	8.48	0.20	2071	34.88	39.60	56,56	58.44	69.82
AW5 t3.xlarge	Intel Xeon 8259 - Cascade Lake	2.5 GHz	3.5 GHz	4	16 G/B	EBS GP3	256GB	N/A	N/A	FHD	Server 2019	260	774	1604	570	7.86	0.33	0.66	5,33	9.79	5.88	8.7	0.33	2665	22.91	23.82	72.77	38.39	42.00
AW5 m6i.large	Intel Xeon 8375C - IceLake	2.9 GHz	3.5 GHz	2	8 GiB	EBS GP3	256GB	N/A	N/A	FHD	Server 2019	286	520	981	N/A	8.40	0.28	0.59	3.33	5.37	4.98	8.53	0.20	2978	21.75	42.45	81.33	36.44	74.85
AWS mbixlarge	Intel Xeon 8375C - IceLake	2.9 GHz	3.5 GHz	4	16 GiB	EBS GP3	256GB	N/A	N/A	FHD	Server 2019	385	1081	1574	612	8.11	0.3	0.6	3.9	6.71	4.59	5.41	0.40	2533	13.26	20.28	69.18	22.22	35.75
AW5 mtil.2starge	Intel Xeon 8375C - IceLake	2.9 GHz	3.5 GHz	8	32 G/B	EBS GP3	256GB	N/A	N/A	FHD	Server 2019	406.7	2209	5406	1076	N.61	0.29	0.55	1.69	3.04	0.97	8.2	0.80	3342	2.96	10.76	91.27	4.95	18.98
GCF		Missouri	O STATE OF THE PARTY OF	100	- Control	eyendourne.	000000000000000000000000000000000000000	4.00	and the same	1000	повеной (таке	a manage	100000				A STATE OF THE PARTY OF THE PAR	a the same		ruben@fru	PM.				ruhen@fen.e		Medianie	ruberd fra	me
GCP N1-Standard-2-Win	Intel Xeon - Skylake	2.0 GHz	3.5 GHz	2	7.5 GIB	Zonal SSD PD	256GB	N/A	N/A	FHD	Server 2019	167.3	328.5	544	N/A	7.6	0.35	0.62	7.53	12.16	5.08	5.57	0.20	1777	50.49	38.97	48,54	84.59	68.72
GCP N1-Standard-4-Win	Intel Xeon - Skylake	2.0 GHz	3.5 GHz	4	15 G/B	Zonal SSD PD	256GB	N/A	N/A	FHD	Server 2019	213.9	681.6	1545	594	H.09	0.3	0.6	3.93	7.04	4.86	6.08	0.39	2086	14.06	20.74	56,96	23.57	36.58
GCP E2-Standard-2-Win	Intel Xeon - Broadwell	2.2 GHz	3.7 GHz	2	8 GiB	Zonal SSD PD	256GB	N/A	N/A	FHD	Server 2019	188.8	360.6	736	N/A	7.53	0.35	0.62	6.89	11.85	7:56	6.24	0.15	2720	56.68	47.96	74.53	100.00	84.57
GCP E2-Standard-4-Win	Intel Xeon - Broadwell	2.2 GHz	3.7 GHz	4	16 G/B	Zonal SSD PD	256GB	N/A	N/A	FHD	Server 2019	225.2	701	1626	637	8.01	0.3	0.61	4.19	7.09	5.84	6.15	0.32	2634	17.46	24.80	71.93	29.26	43.73
GCP N2d-Standard-2-Win	AMD EPYC - Rome	2.25	3.3 GHz	2	8 GIB	Zonal SSD PD	256GB	N/A	N/A	FHD	Server 2019	275.7		1163	N/A	8.46	0.29	0.58	3.71	6.60	3.56	4.68	0.18	3662	28.64	47.00	100.00	47.99	82.87
GCP N2d-Standard-4-Win	AMD EPYC - Rome	2.25	3.3 GHz	4	16 G/B	Zonal SSD PD	256GB	N/A	N/A	FHD	Server 2019	343.8	1054	2523	882	8.62	0.29	0.57	2.29	4.12	1.81	4.39	0.36	363L	8.90	23.94	99.15	14.92	42.22
GCP custom-2-4095-Win		-	3.5 GHz	_	4 GiB	the second secon	-	N/A		FHD	Server 2019	170	315		N/A	7.5	0.34	0.65	7.87	11.16	8.17	6.63	0.18	2190	53.16	41.90	59.80	89.07	73.88
Physical PC	E 32 0				11			100	Alexander of the last	1110	rubenditra me						0.00			mben@ma	me		-		rubendirm e			nomato	me
Workstation-RSP	AMD Ryzen 7 5800X	3.8 GHz	4.7 GHz	16	128 GB	NVMe	2TB	NVIDIA RTX A6000	48 GB	FHD	Win11 22H2	647	6461	13674	1463	9.22	0.29	0.63	3.71	6.90	0.71	0.74	N/A	N/A	N/A	N/A:	N/A	N/A	N/A
Nutania AHV											mitendifra.ma									ruben@ha.					ruben@fra.e			ruben@ha	arries .
AIR8GB - OVH	Intel Xeon Gold 622R - Dempsey	2.9 GHz	3.9 GHz	4	8 G8	HGR-HCI-1 (AF)	100GB	N/A	N/A	FHD	Win10 22H2	393.6	1377	3151	815	8.52	0.3	0.65	2.24	3.51	1.8	3.19	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	-				10000			- love -	- Andrew			12.00	11/2/10	100000	212 211	11 10.	-00121	A COLOR	34.14	1000	722.1		. 5.00	111/500	1.000			110	
F								Date		5/20/20	23				notes	about p	ricing		Price \$/hour	AND SOURCE									
								Author		ruben@	fra.me								On-demand p	ricing				100	201		1000	-	
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	Copyright, contact us if you want to use content												ARM DE RESEAR																



CPU INSTANCE PERFORMANCE & COSTS

Instance	CPU (CPU Base Clock Speed	Max CPU Speed - single- core	vCPUs	RAM	Storage Type	Storage Size	GPU	GPU RAM	Display	os
Microsoft Azure									,		ruben@fra.me
Azure D2s_v3	Intel Xeon 8272 - Cascade Lake	2.6 GHz	3.7 GHz	2	8 GiB	Premium-SSD	256GB	N/A	N/A	FHD	Win10 22H2
Azure D4s_v3	Intel Xeon 8272 - Cascade Lake	2.6 GHz	3.7 GHz	4	16 GiB	Premium-SSD	256GB	N/A	N/A	FHD	Win10 22H2
Azure D2s_v5	Intel Xeon 8370C - IceLake	2.8 GHz	3.5 GHz	2	8 GiB	Premium-SSD	256GB	N/A	N/A	FHD	Win10 22H2
Azure D2s_v5	Intel Xeon 8370C - IceLake	2.8 GHz	3.5 GHz	2	8 GiB	Standard-SSD	256GB	N/A	N/A	FHD	Win10 22H2
Azure D4s_v5	Intel Xeon 8370C - IceLake	2.8 GHz	3.5 GHz	4	16 GiB	Premium-SSD	256GB	N/A	N/A	FHD	Win10 22H2
Azure D4s_v5	Intel Xeon 8370C - IceLake	2.8 GHz	3.5 GHz	4	16 GiB	Standard-SSD	256GB	N/A	N/A	FHD	Win10 22H2
AWS											ruben@fra.me
AWS t3.medium	Intel Xeon 8259 – Cascade Lake	2.5 GHz	3.5 GHz	2	4 GiB	EBS GP3	256GB	N/A	N/A	FHD	Server 2019
AWS t3.large	Intel Xeon 8259 – Cascade Lake	2.5 GHz	3.5 GHz	2	8 GiB	EBS GP3	256GB	N/A	N/A	FHD	Server 2019
AWS t3.xlarge	Intel Xeon 8259 – Cascade Lake	2.5 GHz	3.5 GHz	4	16 GiB	EBS GP3	256GB	N/A	N/A	FHD	Server 2019
AWS m6i.large	Intel Xeon 8375C - IceLake	2.9 GHz	3.5 GHz	2	8 GiB	EBS GP3	256GB	N/A	N/A	FHD	Server 2019
AWS m6i.xlarge	Intel Xeon 8375C - IceLake	2.9 GHz	3.5 GHz	4	16 GiB	EBS GP3	256GB	N/A	N/A	FHD	Server 2019
AWS m6i.2xlarge	Intel Xeon 8375C - IceLake	2.9 GHz	3.5 GHz	8	32 GiB	EBS GP3	256GB	N/A	N/A	FHD	Server 2019
GCP											ruben@fra.me
GCP N1-Standard-2-Win	Intel Xeon - Skylake	2.0 GHz	3.5 GHz	2	7.5 GiB	Zonal SSD PD	256GB	N/A	N/A	FHD	Server 2019
GCP N1-Standard-4-Win	Intel Xeon - Skylake	2.0 GHz	3.5 GHz	4	15 GiB	Zonal SSD PD	256GB	N/A	N/A	FHD	Server 2019
GCP E2-Standard-2-Win	Intel Xeon - Broadwell	2.2 GHz	3.7 GHz	2	8 GiB	Zonal SSD PD	256GB	N/A	N/A	FHD	Server 2019
GCP E2-Standard-4-Win	Intel Xeon - Broadwell	2.2 GHz	3.7 GHz	4	16 GiB	Zonal SSD PD	256GB	N/A	N/A	FHD	Server 2019
GCP N2d-Standard-2-Win	AMD EPYC - Rome	2.25	3.3 GHz	2	8 GiB	Zonal SSD PD	256GB	N/A	N/A	FHD	Server 2019
GCP N2d-Standard-4-Win	AMD EPYC - Rome	2.25	3.3 GHz	4	16 GiB	Zonal SSD PD	256GB	N/A	N/A	FHD	Server 2019
GCP custom-2-4096-Win	Intel Xeon - Skylake	2.0 GHz	3.5 GHz	2	4 GiB	Zonal SSD PD	256GB	N/A	N/A	FHD	Server 2019
Physical PC	ř .										ruben@fra.me
Workstation-RSP	AMD Ryzen 7 5800X	3.8 GHz	4.7 GHz	16	128 GB	NVMe	2TB	NVIDIA RTX A6000	48 GB	FHD	Win11 22H2
Nutanix AHV		and the second second	1000 0000		2000		0551610-0			54000	ruben@fra.me
AIR8GB - OVH	Intel Xeon Gold 622R - Dempsey	2.9 GHz	3.9 GHz	4	8 GB	HGR-HCI-1 (AF)	100GB	N/A	N/A	FHD	Win10 22H2



CPU INSTANCE PERFORMANCE & COSTS

Instance	CPUZ - ST	CPUZ -	CBR23 - MC	CBR23 - SC	EUX 2023			EUC Score GDI+ Dragon	EUC Score	EUC Score Rectangles	EUC Score	Price
	34									Avenderen Andre	771-72	
Microsoft Azure									ruben@fra.r	101		
Azure D2s_v3	241.1	427.2	489	N/A	7.37	0.54	0.72	5.68	9.52	6.44	7.82	0.21
Azure D4s_v3	250.7	817.2	1308	659	7.85	0.31	0.69	3.27	5.57	3.28	6.4	0.42
Azure D2s_v5	323.4	545.4	1284	N/A	8.23	0.35	0.63	3.12	5.51	3.58	7.62	0.20
Azure D2s_v5	308.9	570	1216	N/A	7.38	0.33	0.67	3.36	5.06	3.28	10.96	0.20
Azure D4s_v5	410	1101	2724	1055	8.03	0.3	0.61	1.83	3.31	1.36	6.64	0.41
Azure D4s_v5	390	1092	2521	960	6.87	0.29	0.59	2.02	3.33	1.55	9.03	0.41
AWS									ruben@fra.r	ne		
AWS t3.medium	208.2	396.6	773	N/A	7.94	0.36	0.65	5.48	8.72	6.41	9.47	0.14
AWS t3.large	222.8	425.8	594	N/A	7.92	0.34	0.62	5.18	8.77	7.12	8.48	0.20
AWS t3.xlarge	260	774	1604	570	7.86	0.33	0.66	5.33	9.79	5.88	8.7	0.33
AWS m6i.large	286	520	981	N/A	8.49	0.28	0.59	3.33	5.37	4.98	8.53	0.20
AWS m6i.xlarge	385	1081	1574	612	8.11	0.3	0.6	3.9	6.71	4.59	5.41	0.40
AWS m6i.2xlarge	406.7	2209	5406	1076	8.61	0.29	0.55	1.69	3.04	0.97	8.2	0.80
GCP									ruben@fra.n	ne		
GCP N1-Standard-2-Win	167.3	328.5	544	N/A	7.6	0.35	0.62	7.53	12.16	5.08	5.57	0.20
GCP N1-Standard-4-Win	213.9	681.6	1545	594	8.09	0.3	0.6	3.93	7.04	4.86	6.08	0.39
GCP E2-Standard-2-Win	188.8	360.6	736	N/A	7.53	0.35	0.62	6.89	11.85	7.56	6.24	0.16
GCP E2-Standard-4-Win	225.2	701	1626	637	8.01	0.3	0.61	4.19	7.09	5.34	6.15	0.32
GCP N2d-Standard-2-Win	275.7	538.7	1163	N/A	8.46	0.29	0.58	3.71	6.60	3.56	4.68	0.18
GCP N2d-Standard-4-Win	343.8	1054	2523	882	8.62	0.29	0.57	2.29	4.12	1.81	4.39	0.36
GCP custom-2-4096-Win	170	315	691	N/A	7.5	0.34	0.65	7.87	11.16	8.17	6.63	0.18
Physical PC									ruben@fra.n	ne		
Workstation-RSP	647	6461	13674	1463	9.22	0.29	0.63	3.71	6.90	0.71	0.74	N/A
Nutanix AHV									ruben@fra.n	ne		
AIR8GB - OVH	393.6	1377	3151	815	8.52	0.3	0.65	2.24	3.51	1.8	3.19	N/A

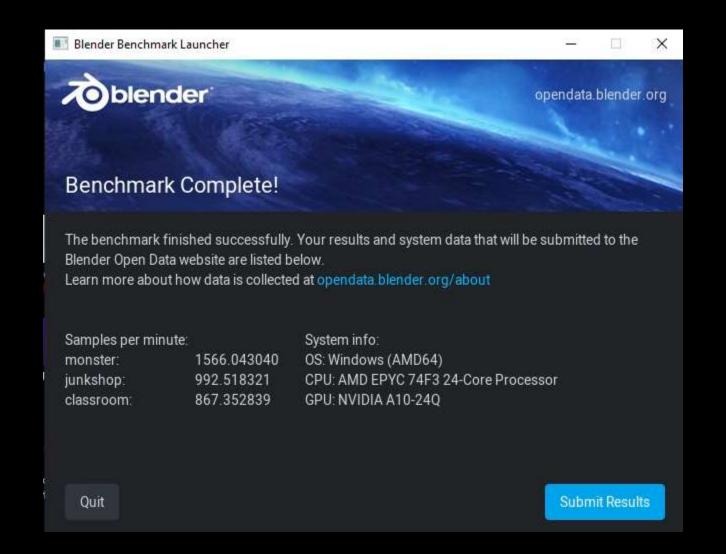


CPU INSTANCE PERFORMANCE/COSTS OBSERVATIONS

- Azure: Use v5 machine instead of v3 25% better performance and sightly lower price
- AWS: Use the m6i.larger instead t3.large when available same price, better CPU performance
- Azure machines in favor of AWS same price but better CPU performance
- GCP overall cheapest but also lowest CPU performance
- If applications are less CPU demanding, then GCP is in favor because of attractive price compared to Azure/AWS







Blender BenchMark

SPECviewperf® 2020 Results

http://www.spec.org/gwpg

Composite Scores (1920x1080)

SPECviewperf measures the frame rate, or frames per second (FPS), at which your graphics card can render scenes across a wide variety of applications and usage models. Each viewset represents an application or a usage model, and each composite score below is based on a weighted geometric mean of many different scenes and rendering modes.

Composites by Viewset

To explore a viewset in more detail, including the measured frame rate for each test of which the composite score is comprised, click on the viewset name in the menu to the left.

Viewset	Composite Score	Window
3dsmax-07	144.37	1900 x 1060
catia-06	97.79	1900 x 1060
creo-03	108.25	1900 x 1060
energy-03	86.31	1900 x 1060
maya-06	419.07	1900 x 1060

SPECViewPerf 2020

solidworks-07 259.86 1904 x 1060

GPU INSTANCE PERFORMANCE & COSTS - FULLHD

		Chiam	Man CPU speed	Ť	100	W			n n										100	and the	Sulfa	ades State	A Park	4	Market States		Outroom	10	in	1000	Michigan	BRC 6	one in	u 190	NAC-	1000 10	10		1			li)	, Y	7	100	1		100	
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Instance	СРИ	CPU Base Clock Speed	Max CPU Speed - single- core	vCPUs	RAM	Storage Type	Storage Size	GPU	GPU RAM	GPU Driver	Display	os
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Microsoft Azure	0.0											
Azure NV6	Intel Xeon E5-2690v3 - Haswell	2.6 GHz	3.5 GHz	6	56 GiB	Standard-SSD	256GB	NVIDIA M60	8 GB	512.78	FHD	Win10 22H2
Azure NV4as_v4	AMD EPYC 7V12 - Rome	2.45 GHz	3.3 GHz	4	14 GiB	Premium-SSD	256GB	AMD MI25	2 GB	22.10.01.1	FHD	Win10 22H2
Azure NV8as_v4	AMD EPYC 7V12 - Rome	2.45 GHz	3.3 GHz	8	28 GiB	Premium-SSD	256GB	AMD MI25	4 GB	22.10.01.1	FHD	Win10 22H2
Azure NV16as_v4	AMD EPYC 7V12 - Rome	2.45 GHz	3.3 GHz	16	56 GiB	Premium-SSD	256GB	AMD MI25	8 GB	22.10.01.1	FHD	Win10 22H2
Azure NV32as_v4	AMD EPYC 7V12 - Rome	2.45 GHz	3.3 GHz	32	112 GiB	Premium-SSD	256GB	AMD MI25	16 GB	22.10.01.1	FHD	Win10 22H2
Azure NC4asT4_v3	AMD EPYC 7V12 - Rome	2.45 GHz	3.3 GHz	4	28 GiB	Premium-SSD	256GB	NVIDIA T4	16 GB	512.78	FHD	Win10 22H2
Azure NC8asT4_v3	AMD EPYC 7V12 - Rome	2.45 GHz	3.3 GHz	8	56 GiB	Premium-SSD	256GB	NVIDIA T4	16 GB	512.78	FHD	Win10 22H2
Azure NC16asT4_v3	AMD EPYC 7V12 - Rome	2.45 GHz	3.3 GHz	16	110 GiB	Premium-SSD	256GB	NVIDIA T4	16 GB	512.78	FHD	Win10 22H2
Azure NV6adsA10_v5	AMD EPYC 74F3 - Milan	3.2 GHz	4.0 GHz	6	55 GiB	Premium-SSD	256GB	NVIDIA A10 4Q	4 GB	512.78	FHD	Win10 22H2
Azure NV12adsA10_v5	AMD EPYC 74F3 - Milan	3.2 GHz	4.0 GHz	12	110 GiB	Premium-SSD	256GB	NVIDIA A10 8Q	8 GB	512.78	FHD	Win10 22H2
Azure NV36adsA10_v5	AMD EPYC 74F3 - Milan	3.2 GHz	4.0 GHz	36	440 GIB	Premium-SSD	256GB	NVIDIA A10 24Q	24 GB	512.78	FHD	Win10 22H2
Azure NG8ads V620 v1	AMD EPYC 7763 - Genoa	2.45 GHz	3.5 GHz	8	16 GIB	Premium-SSD	256GB	AMD V620 1/4	8 GB	23.Q3	FHD	Win10 22H2
Azure NG16ads V620 v1	AMD EPYC 7763 - Genoa	2.45 GHz	3.5 GHz	16	32 GiB	Premium-SSD	256GB	AMD V620 1/2	16 GB	23.Q3	FHD	Win10 22H2
Azure NG32ads V620 v1	AMD EPYC 7763 - Genoa	2.45 GHz	3.5 GHz	32	64 GIB	Premium-SSD	256GB	AMD V620 1/1	32 GB	23.Q3	FHD	Win10 22H2
AW5												
AWS G4ad.XL	AMD EPYC 7R32 - Rome	2.8 GHz	3.3 GHz	4	16 GiB	EBS GP3	256GB	AMD VS20	8 GB	30.0.21001	FHD	Server 2019
AWS G4ad.2XL	AMD EPYC 7R32 - Rome	_	3.3 GHz	8	32 GiB	EBS GP3	256GB	AMD V520	8 GB	30.0.21001	FHD	Server 2019
AWS G4ad.4XL	AMD EPYC 7R32 - Rome	2.8 GHz	3.3 GHz	16	64 GiB	EBS GP3	256GB	AMD VS20	8 GB	30.0.21001	FHD	Server 2019
AWS G4ad.8XL	AMD EPYC 7R32 - Rome	2.8 GHz	3.3 GHz	32	128 GiB	EBS GP3	256GB	AMD V520 x2	8 GB	30.0.21001	FHD	Server 2019
AWS G4dn.XL	Intel Xeon 8259 - Cascade Lake	2.5 GHz	3.5 GHz	4	16 GiB	EBS GP3	256GB	NVIDIA T4	16 GB	527.41	FHD	Server 2019
AWS G4dn.2XL	Intel Xeon 8259 - Cascade Lake	2.5 GHz	3.5 GHz	8	32 GiB	EBS GP3	256GB	NVIDIA T4	16 GB	527.41	FHD	Server 2019
AWS G4dn.4XL	Intel Xeon 8259 - Cascade Lake	2.5 GHz	3.5 GHz	16	64 GIB	EBS GP3	256GB	NVIDIA T4	16 GB	527.41	FHD	Server 2019
AWS.G4dn.8XL	Intel Xeon 8259 - Cascade Lake	2.5 GHz	3.5 GHz	32	128 GiB	EBS GP3	256GB	NVIDIA T4	16 GB	527.41	FHD	Server 2019
AWS G5.xl	AMD EPYC 7R32 - Rome	2.8 GHz	3.3 GHz	4		EBS GP3	256GB	NVIDIA A10G	24 GB	527.41	FHD	Server 2019
AWS G5.2xl	AMD EPYC 7R32 - Rome	2.8 GHz		8	-	EBS GP3	256GB	NVIDIA A10G	24 GB	527.41	FHD	Server 2019
AWS G5.4xl	AMD EPYC 7R32 - Rome	-	100000000000000000000000000000000000000	16		EBS GP3	256GB	NVIDIA A10G	24 GB	527.41	FHD	Server 2019
AWS G5.8xl	AMD EPYC 7R32 - Rome		CONTRACTOR STREET, SAN SAN	32	-	EBS GP3	256GB	NVIDIA A10G	24 GB	527.41	FHD	Server 2019
GCP	ALL DESCRIPTION OF THE PROPERTY OF THE PROPERT											
GCP N1-STD-2-GPU-T4	Intel Xeon 3647 - Skylake	2.0 GHz	3.5 GHz	2	8 GiB	Zonal SSD PD	256GB	NVIDIA T4	16 GB	528.24	FHD	Server 2019
GCP N1-STD-4-GPU-T4	Intel Xeon 3647 - Skylake	-	3.5 GHz	4	-	Zonal SSD PD	256GB	NVIDIA T4	16 GB	528.24	FHD	Server 2019
GCP N1-STD-8-GPU-T4	Intel Xeon 3647 - Skylake	-		8	1	Zonal SSD PD	256GB	NVIDIA T4	16 GB	528.24	FHD	Server 2019
GCP N1-STD-16-GPU-T4	Intel Xeon 3647 – Skylake	4		16		Zonal SSD PD	256GB	NVIDIA T4	16 GB	528.24	FHD	Server 2019
Physical PC	Limited Control of the Control of th	A solution	No.	1000	- Harrison State		distribution of the last of th	Antimization in	Maria de la companya del companya de la companya del companya de la companya de l			
Workstation-RSP	AMD Ryzen 7 5800X	3.8 GHz	4.7 GHz	16	128 GB	NVMe	2TB	NVIDIA RTX A6000	48 GB		FHD	Win 11 22-H2
Annual Martin State of State o								1				





	CPUZ -	CPUZ -	CBR23 -	CBR23 -	EUX	Blender CPU	Blender CPU	Blender CPU	Blender GPU	Blender GPU	Blender GPU	EUC Score App	EUC Score	EUC Score	EUC Score	EUC Score	EUC Score	SPEC 2020	SPEC 2020	SPEC 2020	SPEC 2020	SPEC 2020	SPEC 2020	SPEC 2020	SPEC 2020	Price
Instance	ST	MT	MC	SC	2023	Monster	Junkshop	Class	Monster	Junkshop	Class	Dialog	App Start	Dragon	Tree	Rect	IOPS	3dsmax	catia	creo	energy	maya	medical	smx	solidw	
Microsoft Azure																		ruben@fi	a me							
Azure NV6	256	1789	3843	671	7.37	26.73	16.21	14.2	157	97	79	0.28	0.62	8.71	15.31	1.55	5.57	44.67	43.35	67.31	23.05	151.39	24.73	194	96	1.33
Azure NV4as v4	348	997	2304	893	7.95	15.63	9.09	7.8	FAIL	FAIL	FAIL	0.29	0.68	106.89	194.31	1.3	14.08	4.09	4.10	4.22	1.42	12.72	2.22	28	11	0.47
Azure NV8as v4	375	2107	4673	937	8.25	33.4	19.53	16.55	78	16	30	0.29	0.65	26.52	49.36	1.05	6.34	9.99	11.95	19.70	25.87	35.47	7.05	59	27	0.94
Azure NV16as v4	395.7	4246	9445	945	8.03	66.53	40.07	32.68	162	56	79	0.29	0.66	10.36	20.83	1.3	3.98	23,53	23.64	37.92	37.22	86.62	14.41	120	56	1.88
Azure NV32as v4	395.4	8414	17896	959	8.37	134.32	80.9	67.02	358	148	197	0.29	0.65	4.3	8.96	1.18	2.88	69.54	48.36	54.79	49.64	202.09	31.84	277	128	3.76
Azure NC4asT4_v3	365.8	1490	2988	909	8.22	21.24	12.38	11.04	725	485	465	0.28	0.61	4.21	8.58	1.08	11.3	83.68	64.26	102.26	38.48	241.46	46.62	293	155	0.81
Azure NC8asT4 v3	376.7	3059	7029	942	8.3	45.94	27.18	23.12	725	485	463	0.28	0.61	4.14	8.21	1.12	3.92	83.64	62.40	92.56	38.55	246.50	46.88	292	155	1.24
Azure NC16asT4_v3	395.9	6020	13959	956	8.28	90.92	55.74	47.12	709	471	466	0.28	0.61	4.52	8.87	1.16	3.67	84.00	59.04	80.78	39.10	248.49	47.17	295	158	2.14
Azure NV6adsA10 v5	494.4	2105	4895	1273	8.41	32,72	19.74	16.09	FAIL	FAIL	FAIL	0.28	0.57	36.32	78.85	0.73	5.26	14.40	18.09	24.58	11.30	51.07	10.73	51	31	0.82
Azure NV12adsA10_v5	511.7	4016	9818	1309	8.36	67.11	41.5	33.44	371	216	196	0.28	0.57	19.12	36.42	0.82	2.68	42.69	41.44	51.57	32.51	125,94	21.93	109	67	1.63
Azure NV36adsA10_v5	548.8	12821	26897	1310	8.4	199.24	125.35	97.6	1566	992	867	0.28	0.56	3.8	7.91	0.82	1.9	144.37	97.79	108.25	86.31	419.07	74.63	451	260	5.47
Azure NG8ads V620 v1	448.2	3472	8062	1053	8.00	54.92	34.5	27.13	249	132	118	0.3	0.75	20.97	39.23	0.99	6.73	32.85	39.13	54.25	27.41	203.58	26.76	122	94	1.41
Azure NG16ads_V620_v1	455.8	7035	16079	1094	8.29	111.07	71.58	54.8	521	283	249	0.29	0.65	12.27	22.82	1.02	4.7	107.44	79.34	97.44	56.70	432.99	64.83	269	197	2.82
Azure NG32ads V620 v1 !	460.7	14182	31377	1097	8.00	111.98	72.68	54.77	1137	641	544	0.3	0.7	5.62	8.41	1.01	3.04	208.51	135.96	135.22	111.66	754.20	128.12	561	322	5.64
AWS																		ruben@fi	a.me							
AWS G4ad.XL	316	960	2317	898	8.45	15.14	9.2	7.55	FAIL	FAIL	FAIL	0.3	0.6	7.67	12.37	2.49	8.12	42.09	28.09	34,43	41.64	157.69	29.45	246	121	0.58
AWS G4ad.2XL	334	1991	4663	923	8.55	31.33	18.62	15.45	FAIL	FAIL	FAIL	0.31	0.59	5.59	13.83	1.52	8.58	43.04	31.33	42.12	41.89	173.20	29.66	251	135	0.82
AWS G4ad.4XL	342	4205	9564	956	8.62	65.6	40.76	32.4	FAIL	FAIL	FAIL	0.32	0.58	6.31	12.88	1.33	8.51	42.71	33.58	47.76	41.56	190.70	29,38	264	138	1.64
AWS G4ad.8XL	354	7917	18173	943	8.61	132	83.06	64.94	FAIL	FAIL	FAIL	0.3	0.59	6.3	13.16	1.37	8.47	41.12	34.26	49.41	42.08	175.69	29.67	269	140	1.64
AWS G4dn.XL	296	859	1615	744	8.32	11.62	7.34	5.59	636	396	367	0.28	0.59	4.87	10.46	1.48	8.3	75.83	56.16	94.43	36.61	193.65	45.89	288	138	0.79
AWS G4dn.2XL	334	1804	3949	786	8.44	25,43	16.59	12.1	640	400	375	0.28	0.58	4.91	9.04	1.33	8.73	77.55	57.77	101.04	36.04	195.34	45.30	276	137	1.23
AWS G4dn.4XL	342	3566	8117	785	8.6	53.09	34.05	25.04	643	405	376	0.29	0.57	4.37	8.35	1.12	8.3	77.30	58.61	102.83	35,45	202.16	45.00	272	137	2.19
AWS.G4dn.8XL	345	7290	16195	816	8.61	109	71.63	52.48	636	397	367	0.28	0.57	4.4	8.03	1.13	7.18	78.04	56.12	102.91	33.38	193.24	44.11	275	147	4.10
AWS G5.xl	320.3	1008	2299	919	8.4	16.03	9.2	7.81	1483	914	821	0.28	0.59	5.48	10.97	1.48	7.92	145.16	94.78	100.43	102.19	352.26	76.11	464	244	1.23
AWS G5.2xl	320.8	2090	4614	928	8.61	30.98	19.13	15.83	1515	944	843	0.28	0.58	5.35	9.9	1.2	8.52	140.76	98.00	109.27	103.27	359.78	74.97	473	265	1.63
AWS G5.4xl	374	4306	9509	887	8.63	65.31	40.47	32.43	1502	942	850	0.29	0.57	4.56	8.51	1.15	8.62	142.71	101.73	117.42	104.03	375.98	77.06	482	272	2.42
AWS G5.8xl	371	8692	18484	965	8.61	132.43	82.46	65.76	1519	933	839	0.28	0.57	4.35	8.74	1.42	8.42	142.95	102.61	117.19	103.98	376.15	77.38	488	273	4.01
GCP																		ruben@fi	a.me				- Common and -			
GCP N1-STD-2-GPU-T4	195	402	869	FAIL	8.5	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	0.31	0.62	8.48	16.08	4.63	5.05	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	1.36
GCP N1-STD-4-GPU-T4	262.8	803.5	1456	694	8.55	12.2	7.16	5,64	FAIL	FAIL	FAIL	0.29	0.6	6.43	15.27	1.56	4.46	73.25	51.12	81.95	34.93	170.11	42.98	266	134	1.65
GCP N1-STD-8-GPU-T4	269.4	1566	3419	707	8.65	22.54	13.77	10.9	608	382	347	0.29	0.58	5.98	12.43	1.5	3.13	73.81	52.22	88.14	34.97	180.27	44.00	272	136	4.02
GCP N1-STD-16-GPU-T4	275.5	3190	6966	694	8.63	45.72	29.69	21.75	630	382	356	0.29	0.58	6.62	12.07	1.31	3.17	73.55	52.84	90.59	34.39	179.02	43.68	269	135	8.52
Physical PC																		ruben@h	a.me							
Workstation-RSP 12	647	6461	13674	1463	9.22	99.22	63.58	49.49	2608	1625	1446	0.29	0.63	3.71	6.9	0.71	0.74	206.64	157.05	157.25	129.16	528.00	93.11	665	403	N/A
																										1 1 1 1
		-	A 14						100		100	-	4	100000	Annual Section 1	de la	50	No.	100		_	the state of the s		-		

DIZZION

Date: 10/31/2023 Author: ruben@fra.me

Author: ruben@fra.me Version v10312023

Notes: Results are indication - not exact science

results might vary

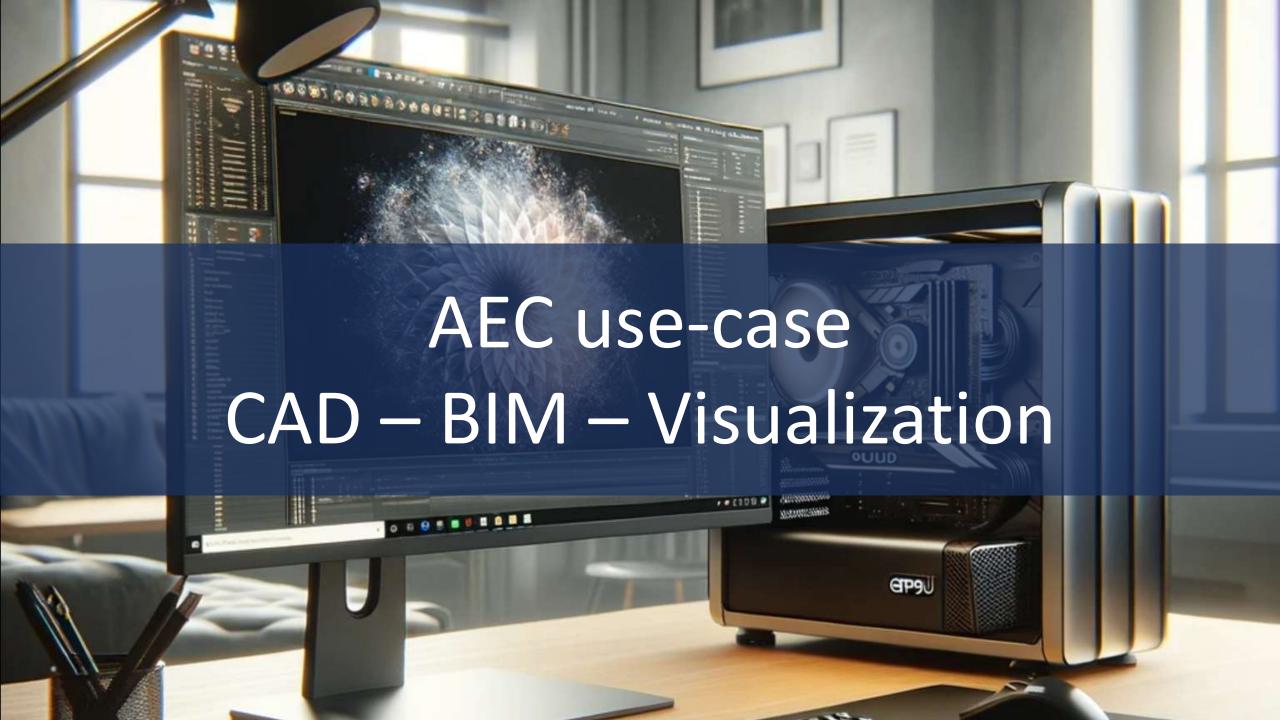
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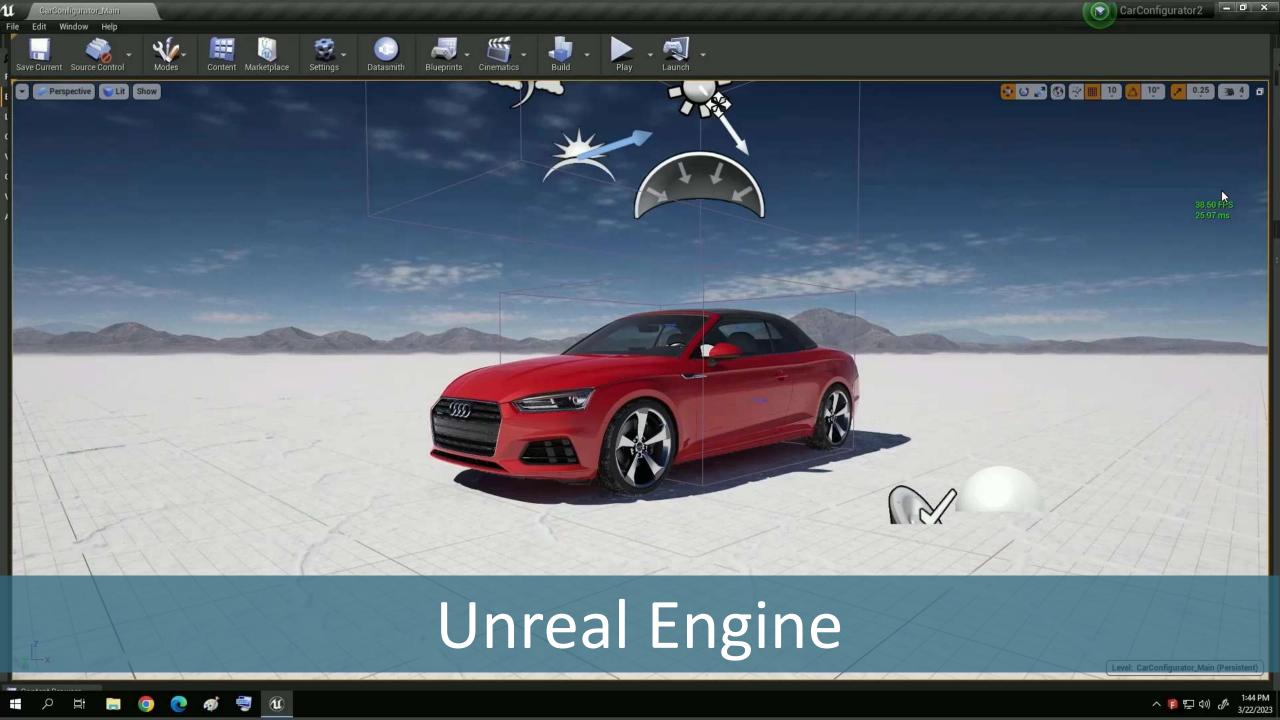
Notes about pricing: Price \$/hour

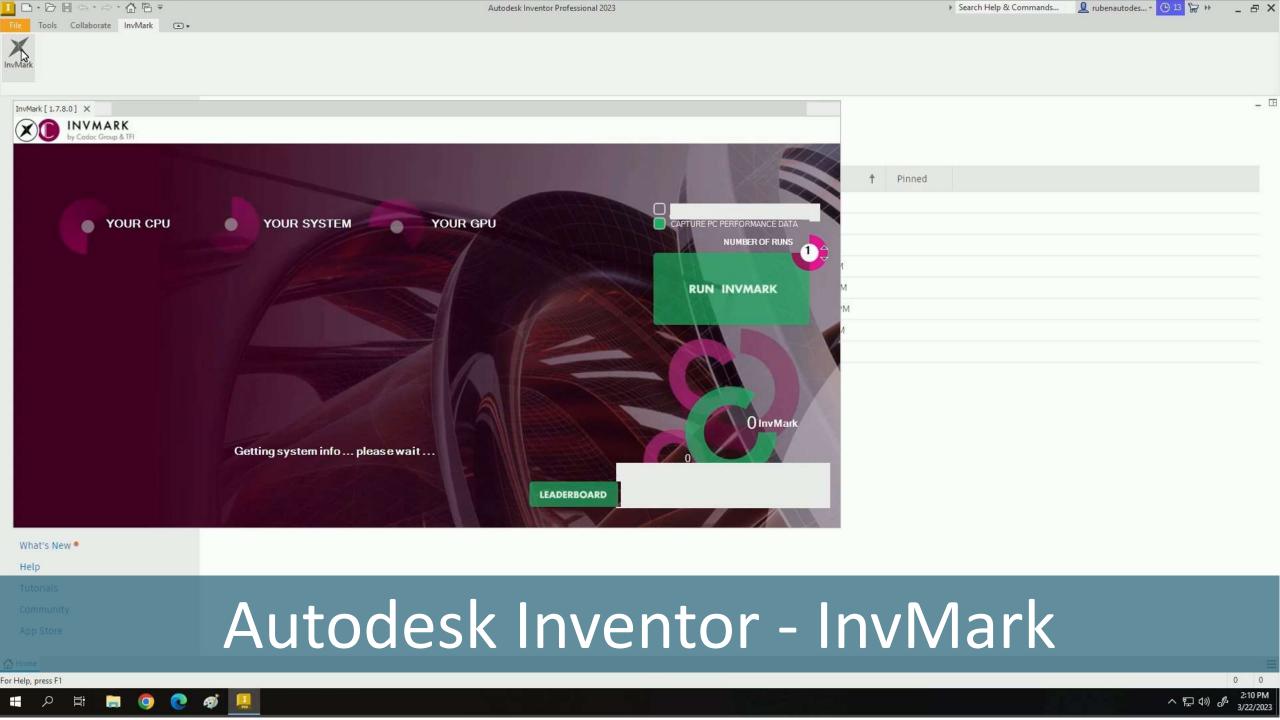
On-demand pricing

Average compute price across all regions

Windows OS License included Storage costs not included











Frame

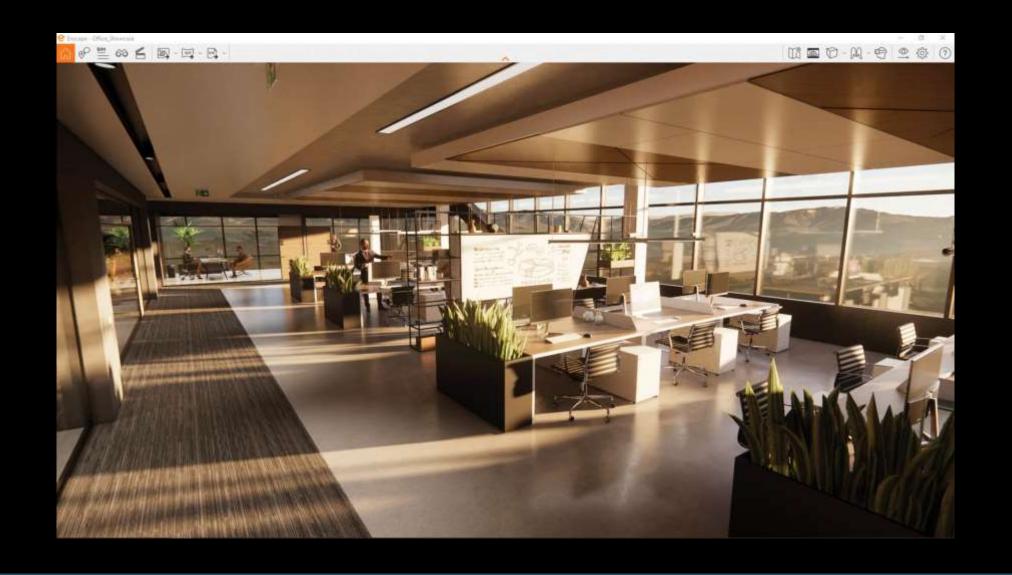
Autodesk Revit - RFOMark







KeyShot



Enscape



V-Ray

GPU INSTANCE PERFORMANCE & COSTS – FULLHD – "AEC"

	IM.	111	erpe Max	Manage Name	_	-	-				W .	Stroke August 18 - 18 - 18 - 18 - 18 - 18 - 18 - 18	2 11 2	Seed Seed Seed Seed	Republication (Rank - Boot NO RIO SHIP BO Casphia - Rands (see) See)	1900 1900 I 190 MA III	Venn venn parti parti den den merika den	II Thefre)623 JO		73		Providence in Providence in Providence in	mendiar Broads NOS - 2025 Ang Ang Milara Sainda	100 er W	-	of the control of the			17 22 22	7 Feet / 100	7=	=			11/11
Secret Name	1					THE PERSON																																
Jenni Willy at	mai time (1) (100/1) (Name)	1500e 310e	0.000	Hereter SX		NVCW-Mes	NE	610,78	PHG.	B-0.194	All of the last	-547 81		1075 0101	146.7	186 476			412	201		110	800 11	11 215	981	414	20 21122 211	1.01	1000	911 14	10.01	3108	20.81	4188 JULY	1216 11	40 14	1105 1521	11000
Neuro WS3_yE	Select Device 22 - 34 Mills A - Harrise 1	14009 1100	12 112 108	E. Manutage 100	D LIBRAR	WYOM MICE	103	511.78	116	WHY5032HE	BELD	Die Die	100	ATMA L BALL	100.8	MEL AM	1.865	356 54	41.5	365	ACR.	704	AND DESCRIPTION	30. 315	100	479 811	THU ACE	1.00	CHARLE	GAL III	20.00	200	31.00	STA TANK	346 3	21 200	LEAR BLA	441000
Start William	AND SPECIFICAL SHARE	240.045(323)4		Francisco de Ario	C 128690	MONG 100.13	708	22.10.50-11	lois.	mental land	8019	1000	100	100 mm	100	100 100	200	100	100	40.0	1111	200	770	1261	100	100	1000		Died.	246	200	10.00	10000	WALL THE PARTY NAMED IN	1900	No. of Concession, Name of Street, or other Designation, or other	10.00	-
Anura Wilden, p4	AND SPY, Tell - Spen AND SPY, Tell - Spen	1.60 0 33.00	0. 0049	Freeza 162	E POWER	WVDMTE.	1008	812.78	ne	W-10 12 N	1000	and the second	100	TATE AND	1000	81.1 S.84	111	107. 182	100	45.5	710	MY 200	1000	200	400	CORP. CORP.	2000	1	1000	0.00	N	NAME OF TAXABLE PARTY.	AND THE PARTY OF	Total Control	THE REAL PROPERTY.	ALC: NAME OF	1000	C THE REAL PROPERTY.
Journ McSecTiL vd	BUE SPIC TILLS Flower		4 1454	Danis of St	r. Iraina	WOM TE	1908	811.78	Track.	W+001340	ARTON BY	25 7:38 75	774	1818 400	97.6	27.5 2.75	84.7	870 YES	75.0 75.0	41.4	1000	78 801	7164 77	404	470	200	TOTAL NO.	7.04	7000 7 33	277	FR 79 80	27.00 72.	11 11 11	BALL COAL	1000	40 ST-00	NAME OF TAXABLE PARTY.	COLUMN TO SERVICE
ASSESSMENT AND	- MATERIAL TELE - BORN	149 04 3104	19 110000	September 115	t library	Model to	1908	211-76	Cont.	Marin met	man 1	16 170 10	110	Tata dia	TOTAL STREET	CT 2.74	100	W	22.0	20.0	100	mar and	1711	100	201	200 200	20000 8000	2.4	2000	Cat I	10 77 10	m 10 111	10 70 77	After 1991	1116	No. of the	10000	-
April Mystatilus	AND SYCTHS - MISS	12 681 AD 911	S STATE	Program 500	25560	W/D4A42014D	969	811.76	Ing.	m-10 10 H	Deliver .	1007	9.5	117.0	111.0	111 3.79	100	1187 77	100	TAKE:	901 6	111 1000	1194 1	215	940	1196 199	11386 - 200	1000	4 60	GRE 8	MIT IN	240	E 100	THE PERSON	2411 24	OT THE REAL	Name of Street	ATTENDED.
Asser Wichelston, v5	WESTER THE MOSE	1204 (400to	12 119-04	Premium SLD	29698	WYDALACD RD	BCB	812.76	Ne	Minist 20143	TOAR .	DATE OF THE PERSON NAMED IN	0.0	DESCRIPTION OF THE PERSON NAMED IN	30.4	210 238	10770	284 255	81.5 3 100	37.6	MACHINE	ALT LINE	2000 7 14	180	1000	1100 040	CHINE NO	1-61	ASSET NAMED	-040 A	10.54	81.70	10.80	1700 ALIE	1400 40	1 80 AE	1845	AT 181 44
Source WVSSARUSER, VS	AUD SPIC THIS - Miles	1258/ 14009	19 HIZ CIT	Freetam 132	0 (26489)	WYDM-KSD74G	2408	812.78	3110	Wind02242	STATE OF	01 TON 1 TH	92	MESS CHIEF	273	219 119	1183	261 (1)	DAYS BED.	26.5	1242	2000	2100 1720	NUMBER OF THE	908	1012 1011	COMP. BOR	7.41	2708 36	GIR N	18 16.28	24.94 88	10. 10.20	3206 LB4F	NOT 1 20	190 2X 50	12.78 T 14.7	75100
ADJUST TORONO, 1922, CO.	BASE SPIC T/SE-DISCO	1.49 (94 33.8%)	6 78.68	Francisco (CE	TOWER .		9,10	11120	2+6	MINISTRAL PROPERTY.	1012	1.08	113.30	ARLE CHIEF	79.0	41.81	818151	15.8 2 007	2015	38.5	DELICE OF STREET	1000	2340 1 14	916	60.7	207 102	CONTRACT OF REAL	1.41	CHITTI I	0.77	11.19	1.04	38.69	THE ASSET	1746 61	AT 100.00	1631 1933	154.40
Appre 940,25w(b),700,05,x(1	weet-time, 1765 - Geross	1.16 Grt 33-9 to		Francisc 550	0.125666	MAR VIOLD S/37	06-68	11.00	me	W-0010HG	12125	CALE	1.000	125 2 100.0	45.0	- MR - 0.00	96.8	14.1 20.8	107 1 104	9000	DELCT IN A	608 000	COAST STREET	AVI.	046	1040 1 1000	337MO 10M	1.01	5430E	10,746	again	33w A8	17:94	4300 JULE	1039 00	(44) 25/20	B30 B2.4	87.56
Jaure 4012 are (H18, x)	skell-direc 1765 - Germa	140 09 3106	12 26.59	Premium 650	19668	MAD 4630 L/1	53 GB	19.05	I/HE	m=0073HI	Santa I	CELLO	18.6	1118 876	STATE OF THE PARTY OF	111 141	60.0	40F 1966	817 654	T STORY	to with the late	STREET, SHEET	Tries III III	2100	THE REAL PROPERTY.	1100 1 100	THE RESERVE AND PERSONS NAMED IN	11000	TAXABLE CO.	G.56	24071	100 10	31.41	CD45 1049	51628 IT THE	ME DEST	SECTION AND	A CHEAR
STATE OF THE PARTY		and the same of the same	J. 1500	A Common or other Designation of the last	10-	manufikum -	35111	100 Carrent	I I SHARE	THE RESERVE OF THE PARTY OF THE		THE RESERVE SHARE	The second second	September 1		trické sigéa	DAMES IN		PERSONAL PROPERTY.			NAMES OF TAXABLE	STATES STATES		A SHAREST P.	A STREET	THE RESERVE AND ADDRESS OF THE PERSON NAMED IN COLUMN TWO	THE RESERVE OF	ACCRECATE VALUE OF THE PARTY.	OF STREET	PERSONAL PROPERTY NAMED IN	Section 1	A ALGORIAN PROPERTY.	ACCOUNT NAMED IN	THE REAL PROPERTY.	ALC: U.S. CO.	angles par	A STATE OF THE PARTY OF THE PAR
AND DRILLE	MARCHANIC TRUE ROAD	1.8193 3.2293	4 14 300	MIDPS	13860	MISS VICES	90.M	800.01881.000	1946	Detyer 1818	1280	1886	123	GREET HOLD	128.0	10.0	ALC: U	31.5 00	80.7	404	001100 0010	216	916 (1)	HER BUTTON	2.04	0.00	11198 146	2.04	8400	0.59	91.00	PETER M	12111	12448 4215	Z100 B4		396312 311	1000
MAS GREEZES:	Jakes SPN 7852 - Roots	14 SNL (13 PW)	8 11,160	s Escoph	12590	MH9 V530	608	90/2/2004/1004	1.0710	leriver 25119	5146	0.86	11.5	155.0 467.0	LOUGH	43.5 0.80	36.5	104 93	17.6	41.3	495 - 11/8	title 855	MATERIAL TO	615	990	494 741	\$164 TO	930	3404	CAN	2045	76(1)	80.81	10006 6776	1800 180	530 36249	38.00	ATT THE OWNER.
AWS CHESTON.	JANES STYC TEXT : Dome	13 CH 13 De		HIS GPS	29669	AME V520:	DOM:	100219011394	1390	Sever 2618	6441.	100	15.9	1951 -2561	808	26.8 X.M	RES	262 92	ETS .	45.4	SATE CO.	sen esa	10 SW 10 10	66 7417	594	A26 253	8424 R366	1.64	9676	GB4	94.80	95.13	25.21	4306 3034	1308 93	66 99.56	13.40 SMI	658.54
ANS DREAM:	unaf Kann SCHT - Cancale Lake	LEGAL RESPO	4 14 pur	L MO OPE	29898	W/GULTE:		BIT-RI.	HE	beyer JELR	2215 7	10 BJ6 24	18.8	1811 (338)	200 h	38.0 3.86	AAT	BEXT: STA	75.8 95.1	38.7	MAC I	752	1400 100	BL BAP	104	773-1 801	SCH SH	2.0	CHEST AP	GRE A	27 34.00	MEAN: 141	NT. NO.61	THERE SHORT	\$300° as	BE 1938	22.32 94.5	436.06
/80.356s28s	HIRI THEO BOTTO - STREET AND LINE	1318; 3339		1100 000	19101	SVDIATE.	1009	MISH	19.5	Decret 2018	190 .	15 T T T T T T T T T T T T T T T T T T T	124	122 402	1913	403 381	204.7	367 364	M7 1285	184 17	71 1	705	1000 10	318	185	199 1995	1179 190	1.11	1000 12	GAL 3	3177	9438 181	THE REAL PROPERTY.	2515	1917 - 91	A ME	19.53	ALLEGA PROPERTY AND ADDRESS OF THE PARTY AND ADDRESS.
AND DISECTE. AND GREAT THE AND GREAT THE	mai Asin 6009 - Contedit John	150kt (150kt		1 100 621	12090	MYDIATE.	1898	547.41	100	Server (213	5050 3	112 12	100	1407 515	37.2	349 7.15	64.8	867 178	491 152	49.1	755	130 356	1008 10	67 117	981	198 764	8130 1808	120	2007	955 8	64 19.75	F1.08 12.1	28 [18.50]	5300 1885	944 6	100 11:51	4.61 100	133-48
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		CPU Base Clock	Max CPU Speed - single-				Storage						
Instance	CPU	Speed	core	vCPUs	RAM	Storage Type	Size	GPU	GPU RAM	GPU Driver	Display	os	
Microsoft Azure		_				4		ruben@fra.me					
Azure NV6 v3	Intel Xeon E5-2690v3 - Haswell	2.60 GHz	3,5 GHz	6	55 GiB	Standard-SSD	256GB	NVIDIA M60	8GB	512.78	FHD	Win10 22H2	
Azure NV12 v3	Intel Xeon E5-2690v3 - Haswell	2.60 GHz	3,5 GHz	12	112 GiB	Standard-SSD	256GB	NVIDIA M60	8GB	512.78	FHD	Win10 22H2	
Azure NV8as v4	AMD EPYC 7V12 - Rome	2.45 GHz	3.3 GHz	8	28 GIB	Premium-SSD	256GB	AMD MI25	4GB	22.10.01.11	FHD	Win10 22H2	
Azure NV16as v4	AMD EPYC 7V12 - Rome	2.45 GHz	3.3 GHz	16	56 GIB	Premium-SSD	256GB	AMD MI25	8GB	22.10.01.11	FHD	Win10 22H2	
Azure NC4asT4 v3	AMD EPYC 7V12 - Rome	2.45 GHz	3.3 GHz	4	28 GiB	Premium-55D	256GB	NVIDIA T4	16GB	512.78	FHD	Win10 22H2	
Azure NC8asT4_v3	AMD EPYC 7V12 - Rome	2.45 GHz	3.3 GHz	8	56 GiB	Premium-SSD	256GB	NVIDIA T4	16GB	512.78	FHD	Win10 22H2	
Azure NC16asT4_v3	AMD EPYC 7V12 - Rome	2.45 GHz	3.3 GHz	16	110 GiB	Premium-SSD	256GB	NVIDIA T4	16GB	512.78	FHD	Win10 22H2	
Azure NV6adsA10 v5	AMD EPYC 74F3 - Milan	3.2 GHz	4.0 GHz	6	55 GiB	Premium-SSD	256GB	NVIDIA A10 4Q	4GB	512.78	FHD	Win10 22H2	
Azure NV12adsA10 v5	AMD EPYC 74F3 - Milan	3.2 GHz	4.0 GHz	12	110 GIB	Premium-SSD	256GB	NVIDIA A10 8Q	8GB	512.78	FHD	Win10 22H2	
Azure NV36adsA10 v5	AMD EPYC 74F3 - Milan	3.2 GHz	4.0 GHz	36	440 GiB	Premium-SSD	256GB	NVIDIA A10 24Q	24GB	512.78	FHD	Win10 22H2	
Azure NG8ads V620 v1	AMD EPYC 7763 - Genoa	2.45 GHz	3.5 GHz	8	16 GiB	Premium-SSD	256GB	AMD V620 1/4	8 GB	23.Q3	FHD	Win10 22H2	
Azure NG16ads V620 v1	AMD EPYC 7763 - Genoa	2.45 GHz	3.5 GHz	16	64 GiB	Premium-SSD	256GB	AMD V620 1/12	16 GB	23.Q3	FHD	Win10 22H2	
Azure NG32ads V620 v1	AMD EPYC 7763 - Genoa	2.45 GHz	3.5 GHz	32	64 GiB	Premium-SSD	256GB	AMD V620 1/1	32 GB	23.Q3	FHD	Win10 22H2	
AWS								ruben@fra.me					
AWS G4ad.XL	AMD EPYC 7R32 - Rome	2.8 GHz	3.3 GHz	4	16 (GiB)	EBS GP3	256GB	AMD V520	8GB	30.0.21001.12042	FHD	Server 2019	
AWS G4ad.2XL	AMD EPYC 7R32 - Rome	2.8 GHz	3.3 GHz	8	32 (GiB)		256GB	AMD V520	8GB	30.0.21001.12042	FHD	Server 2019	
AWS G4ad.4XL	AMD EPYC 7R32 - Rome	2.8 GHz	3.3 GHz	16	64 (GIB)	EBS GP3	256GB	AMD V520	8GB	30.0.21001.12042	FHD	Server 2019	
AWS G4dn.XL	Intel Xeon 8259 - Cascade Lake	2.5 GHz	3.5 GHz	4	-	EBS GP3	256GB	NVIDIA T4	16GB	527.41	FHD	Server 2019	
AWS G4dn.2XL	Intel Xeon 8259 - Cascade Lake	2.5 GHz	3.5 GHz	8	32 (GiB)	EBS GP3	256GB	NVIDIA T4	16GB	527.41	FHD	Server 2019	
AWS G4dn.4XL	Intel Xeon 8259 - Cascade Lake	2.5 GHz	3.5 GHz	16	64 (GiB)	EBS GP3	256GB	NVIDIA T4	16GB	527.41	FHD	Server 2019	
AWS.G4dn.12XL	Intel Xeon 8259 - Cascade Lake	2.5 GHz	3.5 GHz	48	192 (GiB)	EBS GP3	256GB	NVIDIA T4 x 4	16GB x 4	527.41	FHD	Server 2019	
AWS G5.xl	AMD EPYC 7R32 - Rome	2.8 GHz	3.3 GHz	4	16 (GiB)	EBS GP3	256GB	NVIDIA A10G	24GB	527.41	FHD	Server 2019	
AWS G5.2xl	AMD EPYC 7R32 - Rome	2.8 GHz	3.3 GHz	8	32 (GiB)	EBS GP3	256GB	NVIDIA A10G	24GB	527.41	FHD	Server 2019	
AWS G5.4xl	AMD EPYC 7R32 - Rome	2.8 GHz	3.3 GHz	16	1	EBS GP3	256GB	NVIDIA A10G	24GB	527.41	FHD	Server 2019	
AWS G5.8xl	AMD EPYC 7R32 - Rome	2.8 GHz	3.3 GHz	32	128 (GiB)	EBS GP3	256GB	NVIDIA A10G	24GB	527.41	FHD	Server 2019	
GCP								ruben@fra.me					
GCP N1-STD-4-GPU-T4	Intel Xeon 3647 - Skylake	2.0 GHz	3.5 GHz	4	16 (GiB)	Zonal SSD PD	256GB	NVIDIA T4	16GB	528.24	FHD	Server 2019	
GCP N1-STD-8-GPU-T4	Intel Xeon 3647 – Skylake	2.0 GHz	3.5 GHz		1	Zonal SSD PD	256GB	NVIDIA T4	16GB	528.24	FHD	Server 2019	
Physical Workstation	A CONTROL OF THE PROPERTY OF T							ruben@fra.me					
HP Z2 Mini G9	Intel Core i7-12700K	3.6 GHz	5.0 GHz	8P - 4E	32 GB	SSD	1TB	NVIDIA T1000	4GB	511.65	FHD	Win11	
Scan 3XS GWP-ME A13C	Intel Core i9-13900K		5.8 GHz		64 GB	NVMe	2TB	NVIDIA RTX A2000	12GB	517.4	FHD	Win11	
	AMD Ryzen Threadripper Pro 5995WX	and the same of the same of	4.5 GHz	64	128 GB	NVMe	2TB	AMD Radeon Pro W6800	100000000000000000000000000000000000000	22.Q3	FHD	Win11	
Scan 3XS GWP-ME A1128T	AMD Ryzen Threadripper Pro 5995WX	Sala de la companya del companya del la companya del companya de la companya de la companya de la companya del companya de la companya del company	4.5 GHz	64	128 GB	NVMe	2TB	NVIDIA RTX 6000 ada	48GB	528.24	FHD	Win11	





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Instance	vRay 5 - CPU	vRay 5 RTX GPU	- Keyshot 11 - CPU	t Keyshot 11 - GPU	Revit t 2021 RFO - update (sec)	- create	Revit 2021 RFO - export (sec)	Revit 2021 RFO - Render (sec)	Revit 2021 RFO Graphics (sec)	- Rotate	VRED 2023 - no AA	VRED 2023 - med AA	VRED 2023 - ultra high AA	# # PO	Unreal Engine 4.26 Audi - RT ON	Unreal Engine 4.26 Audi - RT OFF	Inventor 2023 - Modelling	Inventor 2023 - Drawing	Inventor 2023 - FEA	Inventor 2023 - SIM	Inventor 2023 - Graphics	Inventor 2023 - RT	Inventor 2023 - Data Translate	Inventor 2023 - Assy Pattern	Inventor 2023 - Assy Constraint	Inventor 2023 - ST	2023 -	Price
Microsoft Azure					100	uben@fra.	me																	- 1	chan@fra.m			4
Azure NV6_v3	2594	FAIL	0.49	4.6	16.5	187.8	546.9	143.7	48.6	4.15	34.0	19.6	9.2	41.0	FAIL	26.2	748	539	709	865	1714	512	557	626	824	7576	3397	1.32
Azure NV12_v3	3425	FAIL	0.66	4.6	14.4	178.9	521.0	104.9	46.1	3.96	34.0	19.6	9.2	42.5	FAIL	26.5	806	590	77.4	891	1736	765	580	676	831	7942	4088	1.84
Azure NV8as_v4	3275	FAIL	0.64	FAIL	12.7	160.4	488.2	115.6	56.5	5.63	10.1	4.8	2.8	15.4	FAIL	4.4	896	577	876	539	1318	689	616	558	572	7312	4012	0.94
Azure NV16as_v4	6288	FAIL	1.24	FAR	12.8	149.4	455.1	61.6	44.5	3.69	17.4	9.4	4.9	27.1	FAIL	18.5	1136	693	879	774	1936	1382	654	697	783	8669	5407	1.88
Azure NC4asT4_v3	2301	589	0.44	23.5	12.7	147.3	490.9	150.1	41.2	3.84	65.8	37.7	18.2	74.6	25.1	41.1	770	581	869	1259	2251	469	620	981	1116	10164	3452	0.81
Azure NC8asT4_v3	4954	662	0.89	23.6	12.4	141.4	452.7	81.6	37.5	3.28	64.7	37.0	17.9	71.7	23.9	41.8	1000	755	907	1244	2345	954	670	988	1148	10473	5064	1.24
Azure NC16asT4_v3	9533	734	1.79	24.6	12.6	143.6	455.1	47:4	39.9	3.23	63.5	37.9	17.9	77.5	24.8	40.9	1321	857	881	1217	2523	1981	681	895	1162	10240	6379	2.14
Azure NV6adsA10_v5	3404	FAIL	0.67	6.6	9.2	115.0	351.2	112.6	37.1	2.78	19.5	12.6	7.5	2.1	FAIL	2.6	961	811	1095	1384	1988	715	865	1256	1387	1,2236	4953	0.82
Azure NV12adsA10_v5	7030	351	1.32	13.9	8.8	101.2	314.3	56.4	31.0	2.28	39.7	25,4	15.1	51.5	FAIL	27.6	1274	1027	1101	1525	2616	1411	933	1165	1450	12735	7068	1.63
Azure NV36adsA10_v5	20283	1544	3.99	52.4	9.2	98.5	316.4	27.3	25.9	2.09	138.3	78.1	41.1	134.2	47.1	88.9	1742	1194	1040	1480	7937	3928	929	1312	1470	12409	9280	5:47
Azure NG8ads_V620_v1	6023	FAIL	1.08	FAIL	10.5	125.8	426.8	76.4	45.9	3.15	31.0	17.8	10.7	10.5	1.5	26.2	1111	870	1004	1342	2453	958	817	952	1137	10579	5702	1.41
Azure NG16ads_V620_v1	12127	FAIL	2.15	FAIL	10.5	122.2	385.4	43.0	36.3	3.26	56.3	34.5	20.6	20.7	19.4	50.6	1521	1026	992	1421	2906	1992	848	1045	1285	11740	7660	2.82
Azure NG32ads_V620_v1	24864	FAIL	2.16	FAIL	10.5	121.8	370.4	27.0	31.1	2.45	60.0	60.0	44.1	31.7	42.4	120.0	1616	1126	962	1366	2924	3308	852	1109	1337	11656	8785	5.60
AWS	-					oben@fru.	me			17474	0.00	100000							1000						dan@fra.m			4
AWS G4ad.XL	1391	FAIL	0.32	FAIL	12.1	175.7	508.0	228.0	52.4	4.93	51.9	24.3	9.6	55,7	FAIL	40.9	585	422	768	465	1265	303	534	604	703	7186	2465	0.58
AWS G4ad.2XL	3148	FAIL	0.66	FAIL	11.3	155.9	467.8	109.3	43.3	3.80	52.7	23.9	9.3	57.6	FAIL	41.5	895	578	832	674	1683	655	602	688	767	8364	3914	0.82
AWS G4ad.4XL	6441	FAIL	1.38	FAIL	11.9	155.3	456.1	60.6	39.8	3.38	53.5	24.4	9.4	57.5	FAIL	41.3	1170	663	853	706	1969	1477	644	676	773	8524	5293	1.64
AWS G4dn.XL	1211	392	0.26	22.8	13.4	162.1	525.7	306.6	49.6	4.88	63.7	36.7	17.8	75.0	24.1	28.7	469	414	732	1000	1692	257	525	721	955	8626	2207	0.79
AWS G4dn.2XL	2903	524	0.50	23.6	12.4	153.1	492.2	161.5	40.8	3.82	65.3	36.7	18.3	66.7	24.5	39.3	727	613	760	1086	1999	528	583	759	1000	9179	3606	1.23
AWS G4dn.4XL	6537	583	1.17	23.3	11.2	140.5	515.2	77,3	34.5	3.15	64.8	36.7	17.8	69.1	23.2	40.1	753	618	769	1069	2065	537	601	748	984	9150	3682	2.19
AW5.G4dn.12XL	20090	2375	3,66	49.8	10.7	134.5	438.7	33.7	33.3	3.03	64.5	36.3	17.8	70.8	24.9	41.9	1356	884	803	1194	2402	3210	630	829	1093	9811	6829	4.10
AWS G5.xl	1450	1097	0.30	57.0	12.5	170.1	520.9	232.2	49.0	4.81	152.9	90.1	52.3	127.1	60.9	73.3	572	453	725	1085	1698	354	529	762	1023	8894	2672	1.23
AWS GS.2xl	3150	1323	0.65	56.8	12.0	157.5	477.7	109.9	40.4	3.65	157.8	91.8	52.9	149.2	62.3	102.4	870	680	850	1279	2170	750	624	864	1158	10418	4367	1.63
AWS GS.4xl	6445	1141	1.33	45.6	11.0	150.4	468.4	65.8	36.7	3.33	157.7	92.0	53.0	139.4	60.3	105.0	1179	793	812	1264	2347	1411	658	860	1140	10162	5757	2.42
AW5 G5.8xl	12716	1509	2.75	57.8	11.6	158.5	470.3	37.9	36.5	3.31	155.8	93.6	52.8	150.1	60.5	107.7	1386	865	840	1257	2340	2837	656	918	1181	10435	6811	4.01
GCP	the second		-		+ 1	uben@fra.	me		-	1000						-	-		1000	and the same			-		zben@fra.m		-	
GCP N1-STD-4-GPU-T4	1159	366	0.23	22.4	13.8	187.3	566.5	334.2	55.5	5.56	58.0	35.2	17.3	68.0	FAIL	39.2	436	356	646	842	1383	241	466	643	801	7428	2002	1.65
GCP N1-STD-8-GPU-T4	2408	507	0.47	22.3	13.2	166.1	500.8	157.8	42.0	3.87	57.7	34.7	17.1	67.3	23.1	37.1	703	555	697	973	1731	507	536	716	889	8339	3367	4.02
Physical Workstation															and the second		200000000000000000000000000000000000000				COLUMN TO SERVICE STATE OF THE PARTY OF THE	NAME OF TAXABLE PARTY.	2011000		ben@fru.m	C. Contract		
HP Z2 Mini G9	13288	N/A	2.67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	30.7	16.4	7.8	36.7	N/A	13.1	1912	1745	1328	2171	N/A	2707	1440	1975	2163	N/A	N/A	N/A
Scan 3XS GWP-ME A13C	26952	1012	32.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	68.2	38.2	18.7	72.2	N/A	43.3	2307	2166	1473	2611	N/A	5706	1743	2327	2652	N/A	N/A	N/A
Armari Magnetar M64TP-RW1300G3	66461	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	44.3	38.9	29.0	40.4	N/A	101.4	1941	1394	1132	1449	N/A	11744	1124	1424	1701	N/A	N/A	N/A
Scan 3XS GWP-ME A1128T	59982	5277	187,45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
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Date: 11/03/2023

Author: ruben@fra.me

Credits: Greg Corke - Managing Editor and Co-founder at AEC Magazine, DEVELOP3D, NXT BLD. Director X3D Media

Version v10312023

Notes: Results are indication - not exact science

results might vary

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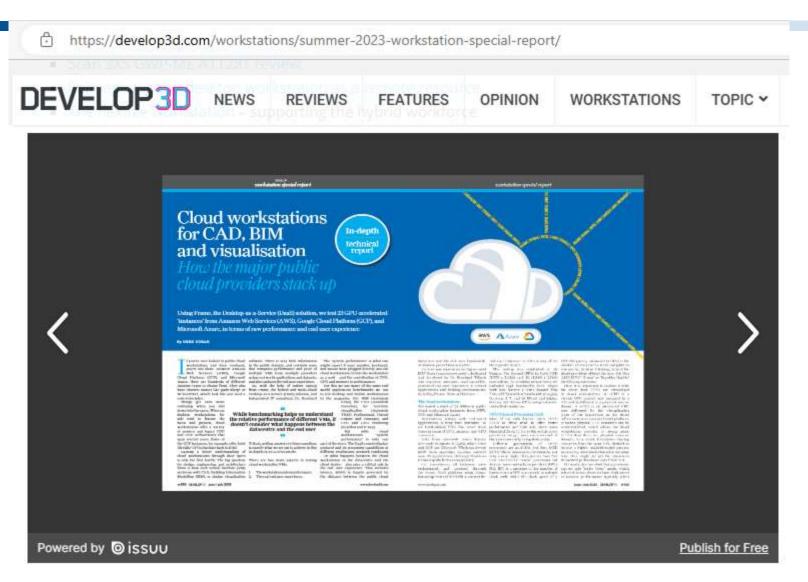
Notes about pricing:

Price S/hour On-demand pricing

Average compute price across all regions

Windows OS License included Storage costs not included





Autor: Greg Corke, DEVELOP3D's Managing Editor and resident workstation specialist



GPU INSTANCE PERFORMANCE/COSTS OBSERVATIONS

- Azure NVv4 machines with SPEC is not great performance; Low 3D performance, no video encoding / no hardware encoding exposed
- Azure NV4v4 is limited in fps (18 is max)
- Azure NV4v4 GPU compute is bad compared to CPU, the CPU outperforms the GPU looking at EUC Score 'Tree' and 'Dragon'
- Azure NVv4 CPU/Price performance is good cheap & decent CPU performance
- Azure NVv4 if you don't need a GPU ... don't go for the cheap accelerated VM (NV4v4/NV8v4) use e.g., D4s_v5



GPU INSTANCE PERFORMANCE/COSTS OBSERVATIONS

- Azure NC8asT4 (NVIDIAT4) if you don't need the vCPUs or RAM go for the NC4asT4 same GPU; SPEC performance almost the same, 30% cheaper
- Azure NV6adsA10 (NVIDIA A10 GPU) more CPU and RAM at the same price as the NC4asT4; NC4asT4
 provides much better GPU performance because of full GPU vs GPU partition
- If you need GPU performance, don't use Azure NVadsA10 with smaller GPU partitions; the NCasT4 with dedicated GPU provides better performance.
- Azure NVadsA10 (NVIDIA A10 GPU) has high base clock speed 3.2 GHz
- Azure NGads_V620 (AMD V620 GPU) has great CPU and GPU; Performance is great!
- Azure NGads_V620 (AMD V620 GPU) price isn't as low as expected (since no GPU licensing). Perf/Watt here
- Winner on Azure: NC4/NC8asT4 Great price/perf ratio dedicated GPU!
- If you have still the NV6/NV12 running switch to NC4/NC8 migrate away;



GPU INSTANCE PERFORMANCE/COSTS OBSERVATIONS

- AWS G4ad (AMD V520 GPU) do have a very good performance/price ratio
- AWS G4ad (AMD V520 GPU) does not provide the highest GPU performance but decent
- AWS G5 (NVIDIA A10) outstanding performance also compared to Azure
- GCP has the best performing GPU (Ada LoveLace L4) at this moment
- GCP: CPU performance is limiting why is it 2.0GHz …
- GCP: Double the price compared to AWS (G4dn) Azure (NC4v4) and lower (CPU) performance not great!
- Check GPU availability
 - Azure: https://azure.microsoft.com/en-us/explore/global-infrastructure/products-by-region/?products=virtual-machines®ions=all
 - AWS: https://instances.vantage.sh/
 - GCP: https://cloud.google.com/compute/docs/gpus/gpu-regions-zones



CHECK GPU AVAILABILITY E.G. AZURE

Products	North Europe	West Europe	France Central	France South	Germany North	Germany West Central	Italy North	Norway East	Norway West	Sweden Centra
NC A100 v4 Series	~	~	~							~
NCasT4v3-series	~	~				~	~			~
NCsv2-series		~								
NCsv3-series	~	~	~							
ND A100 v4 Series		~								
NDm A100 v4 Series		~								
NDs-series		~								
NDv2-series		~								
NG_V620-v1-series	0									
NP-series		~								
NV-series	~	~								
NVads A10 v5 series	~	~	~			~				~
NVv3-series	~	~	~					~	~	
NVv4-series	~	~				~				



HIGH-END CLOUD WORKSTATIONS

- Cloud Workstations beat the 2–4-year-old CAD/CAM workstations
- Cloud Workstation cannot beat physical Workstation in performance GPU in Cloud is years behind; CPU often has lower CPU clock speed compared to physical workstation or datacenter HCI
- Very few people need extremely high-end workstations
- Performance is only one (key) topic in decision-making





<u>User Experience and Performance Data</u>

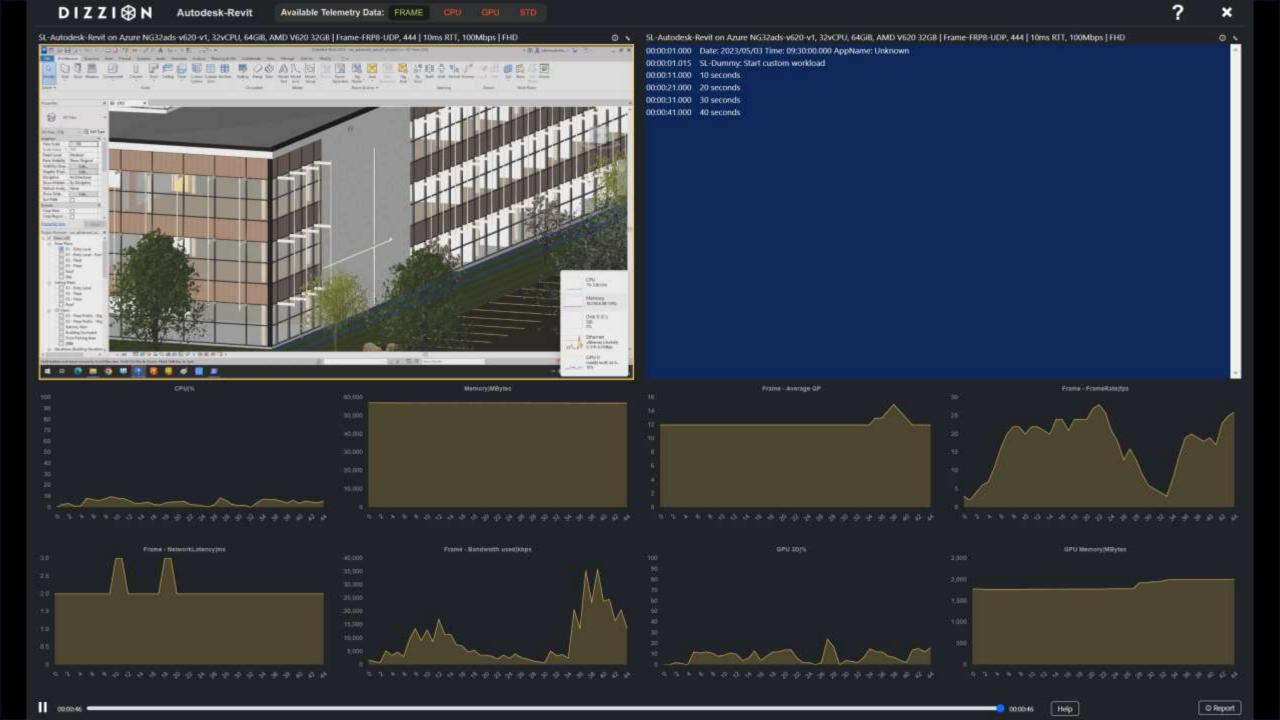
laaS: AWS, Azure, GCP GPU instances Apps: Autodesk Revit, Inventor, VRED, Unreal Engine and Enscape

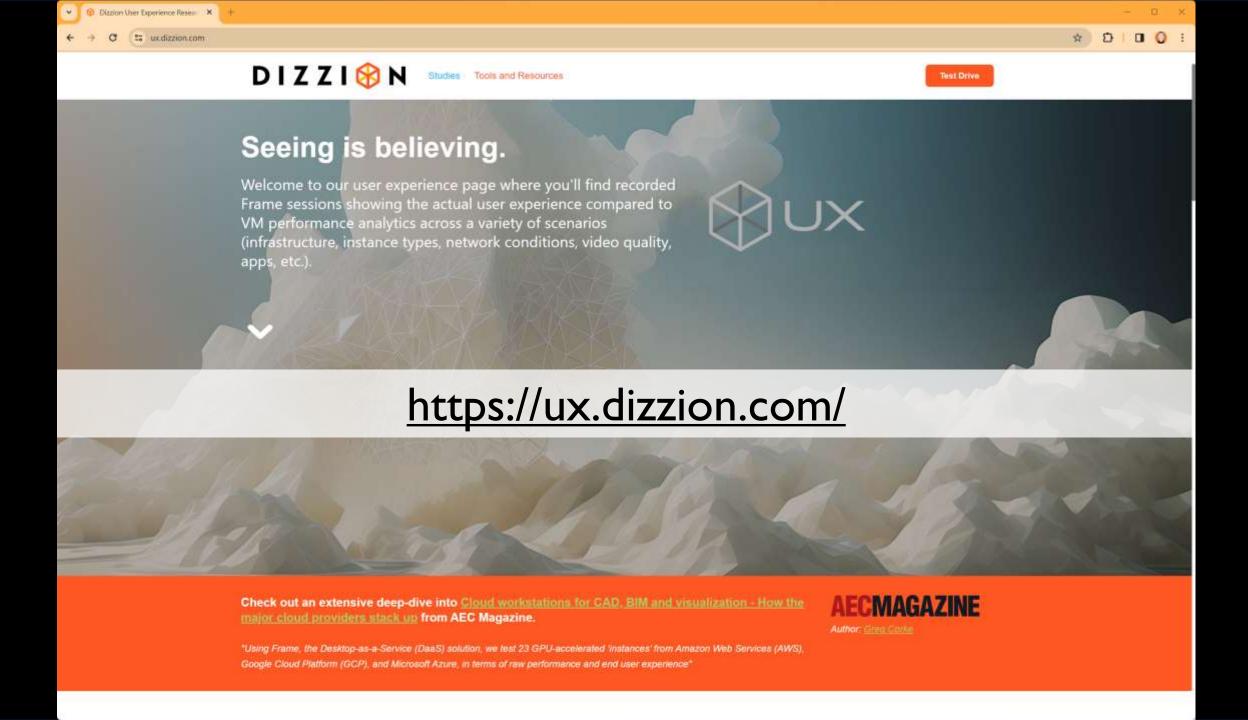
Network: LAN, WAN (2/4/8 Mbps – 10/60/110ms RTT)

Resolution: Full HD and 4K resolution

Color space: YUV420 & YUV444

Results: 40+ studies, 200+ scores







THANK YOU



Ruben Spruijt Field CTO at Dizzion ruben@dizzion.com

This FREE community event is made possible with support of:





