



NerdioCon

2025
— PALM SPRINGS



Beyond Gut Feel

Scientific Methods for Cloud Desktop Testing



Agenda

The Science of Cloud Desktop Testing

Test Setup and Test Scenarios

Performance Tests and Comparisons

Findings and Recommendations

Conclusion



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Performance Data Scientist

Creator of the EUC Score Toolset

<https://drtritsch.com> | <https://eucscore.com>



**NERDIO VALUED
PROFESSIONAL**



Simon Binder

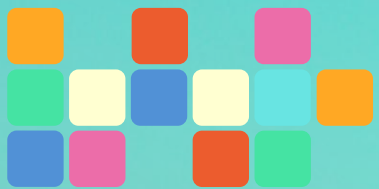
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**NERDIO VALUED
PROFESSIONAL**





The Science of Cloud Desktop Testing





EUC

“Admin Experience”

Hard Metrics



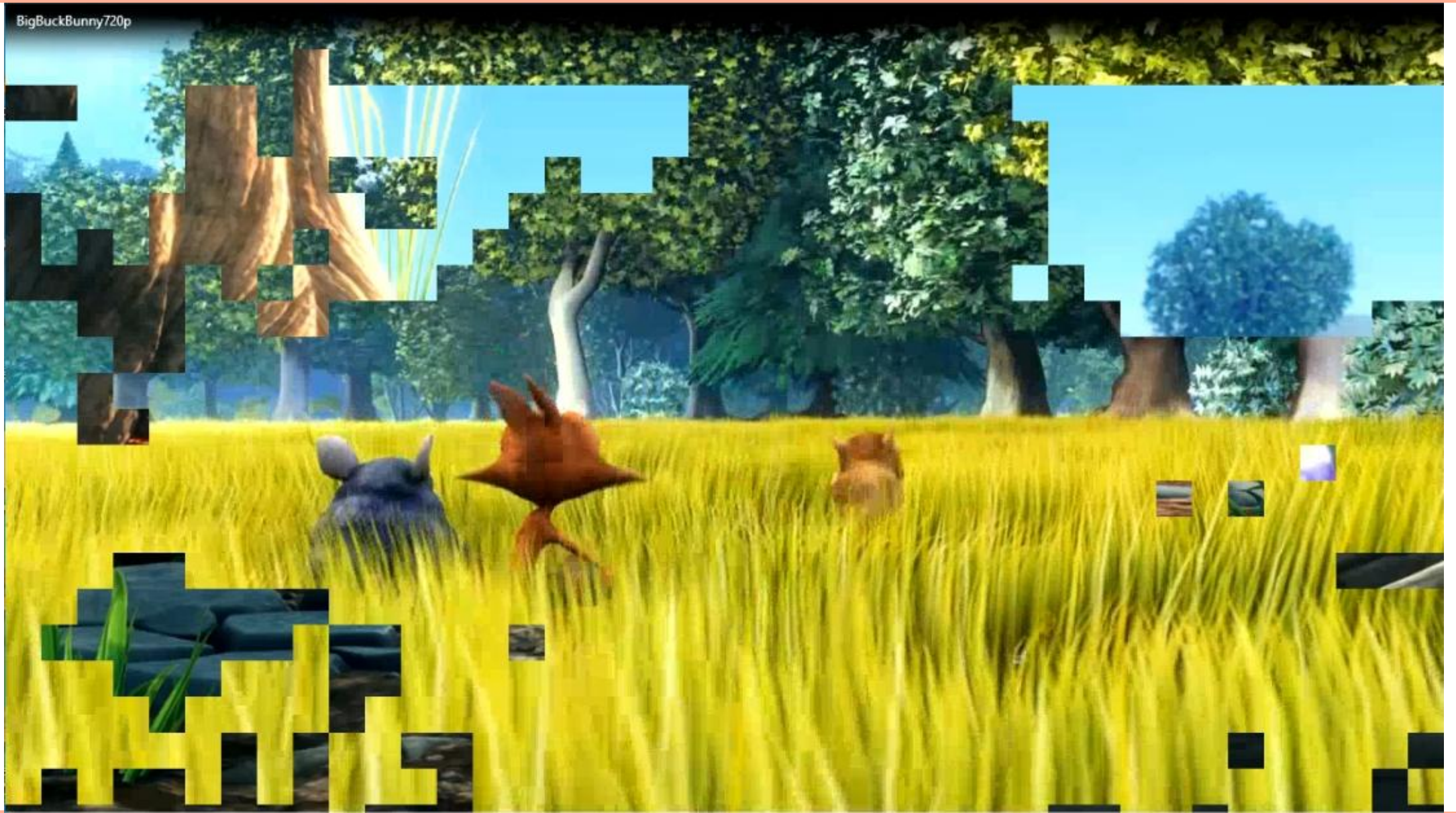
DEX

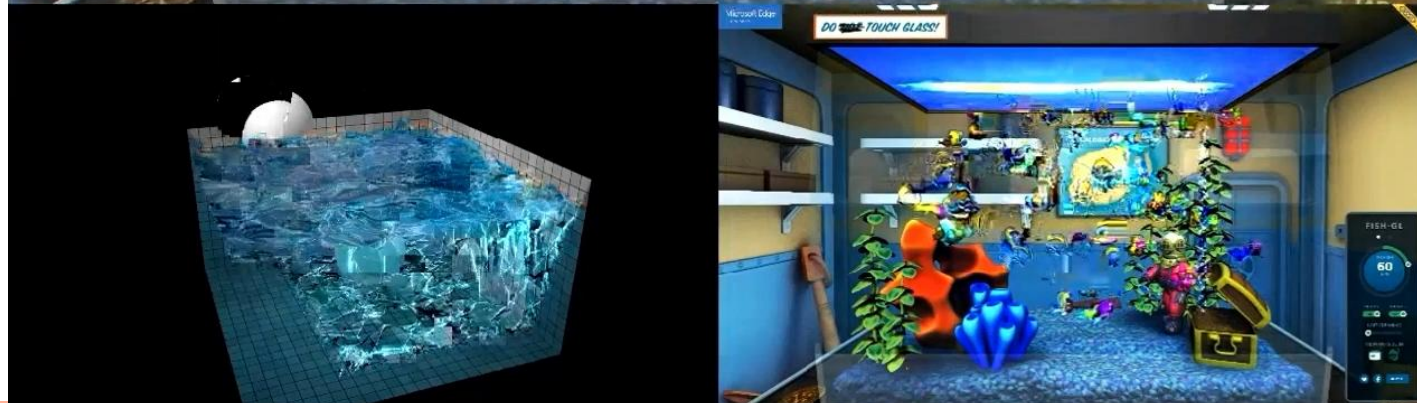
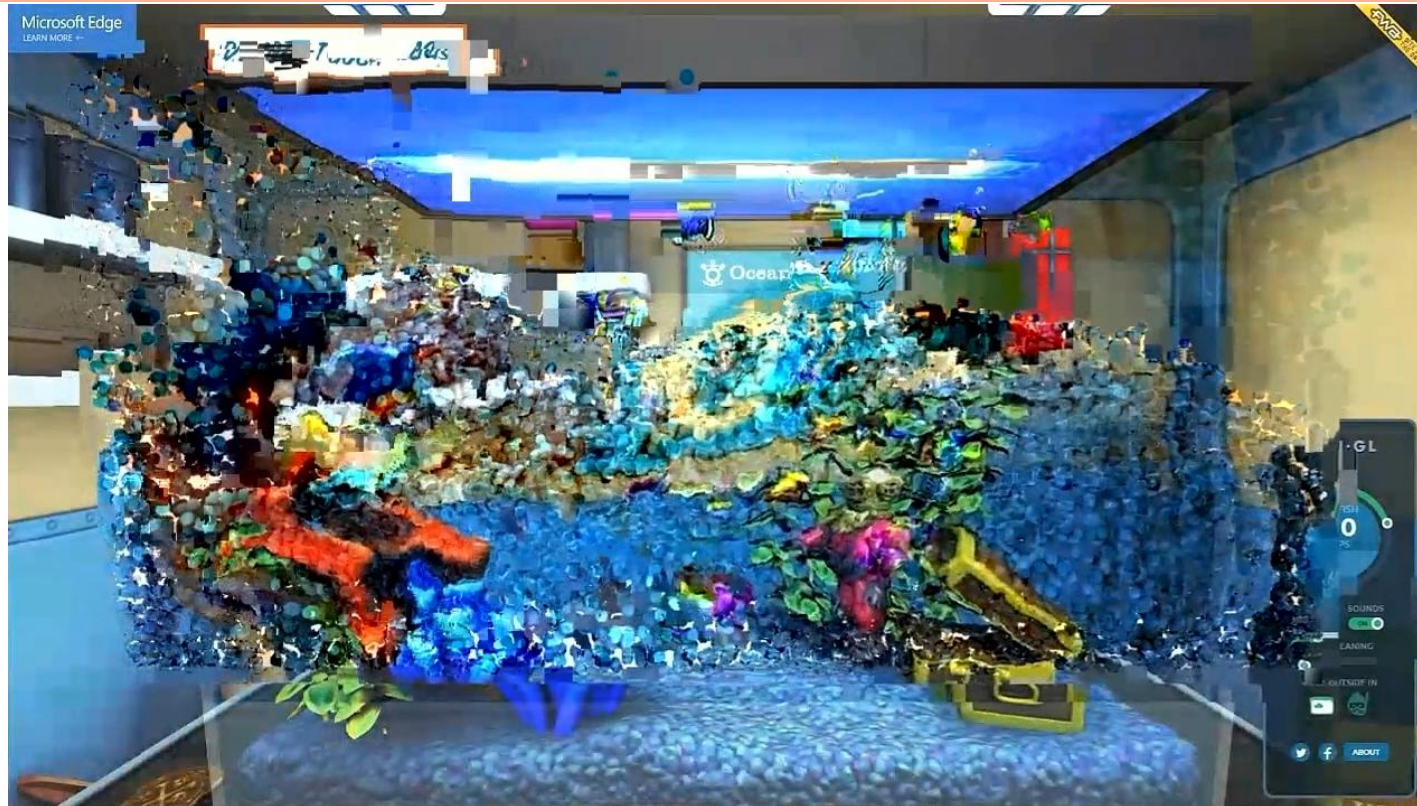
“User Experience”

Soft Metrics



BigBuckBunny720p





1920x1017



CPU
7% 2.11 GHz

Memory
3.8/15.9 GB (24%)











Disk 0 (C:)
SSD
0%

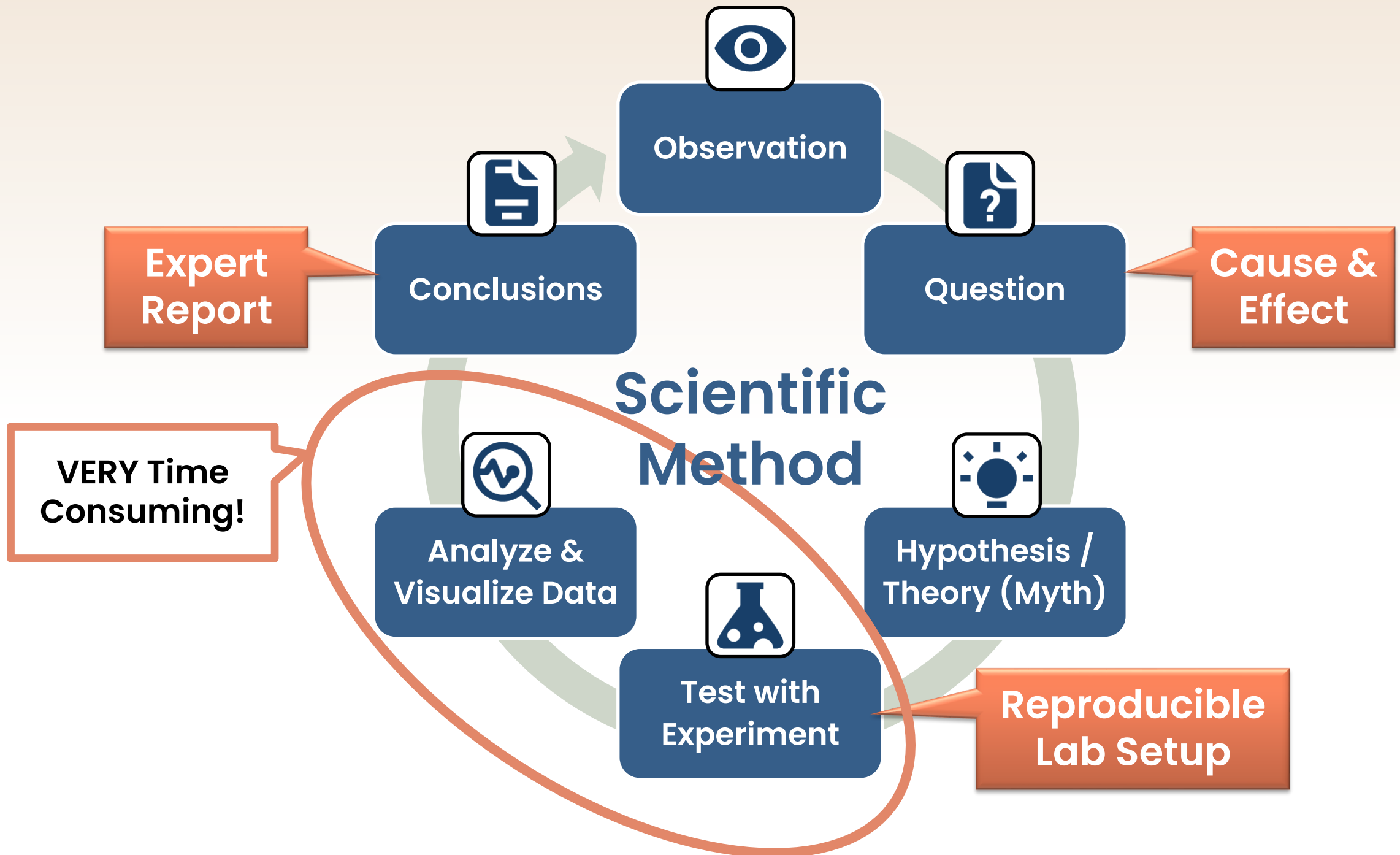
Ethernet
Ethernet 2
S: 0.1 R: 6.5 Mbps

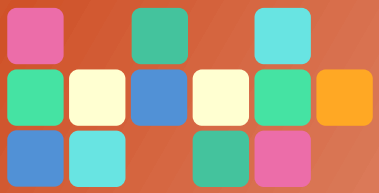
GPU 0
Intel(R) HD Graphi...
0%

GPU 1
Radeon RX Vega ...
1% (47 °C)

From a User's Perspective: EUC Quality Criteria

	Boot and logon duration	Measure boot time + logon time + user session load time until it is ready for user interaction. Includes identity management and authentication methods.
	Application and content load time	Measure time from user starting an application until the content appears and the application is ready for user input, including access to the storage system.
	User input delay (“Lag”)	Measures responsiveness of graphical elements after user-initiated triggers = “time from mouse click to screen update” (lag, latency, system response time).
	Graphics APIs supported	Detect incompatibilities when running graphics applications using the DirectX, OpenGL, Vulkan and WebGL APIs.
	Media formats supported	Detect incompatibilities when opening and playing media files, such as MP4, MPEG, MOV, WMV or AVI.
	Distortion of media	Measure media and screen output quality. Detect image, animation, and audio/video compression and decompression artifacts and anomalies.
	Screen refresh rate	Measure the number of times per second that the desktop or application can draw consecutive images on the screen and in the host frame buffer (frames per sec = fps).
	Endpoint specs and quality	Determine the screens' number of pixels, density, and visual dimensions – frame buffer requirements grow with resolution and screen number. Detect periphery incompatibilities.
	Application reliability and stability	Detect application hangs, freezes, crashes or unhandled exceptions. Measure consistency, dependability and robustness of applications.
	Session consistency and resilience	Check if user state is preserved across subsequent sessions. Measure session disruptions, hangs, disconnects/reconnects, availability, timeouts and redundancy.





Test Setup and Test Scenarios



User Experience Benchmarking

EUC Score Toolset



**Simulated
Workloads**



**Telemetry
Data**



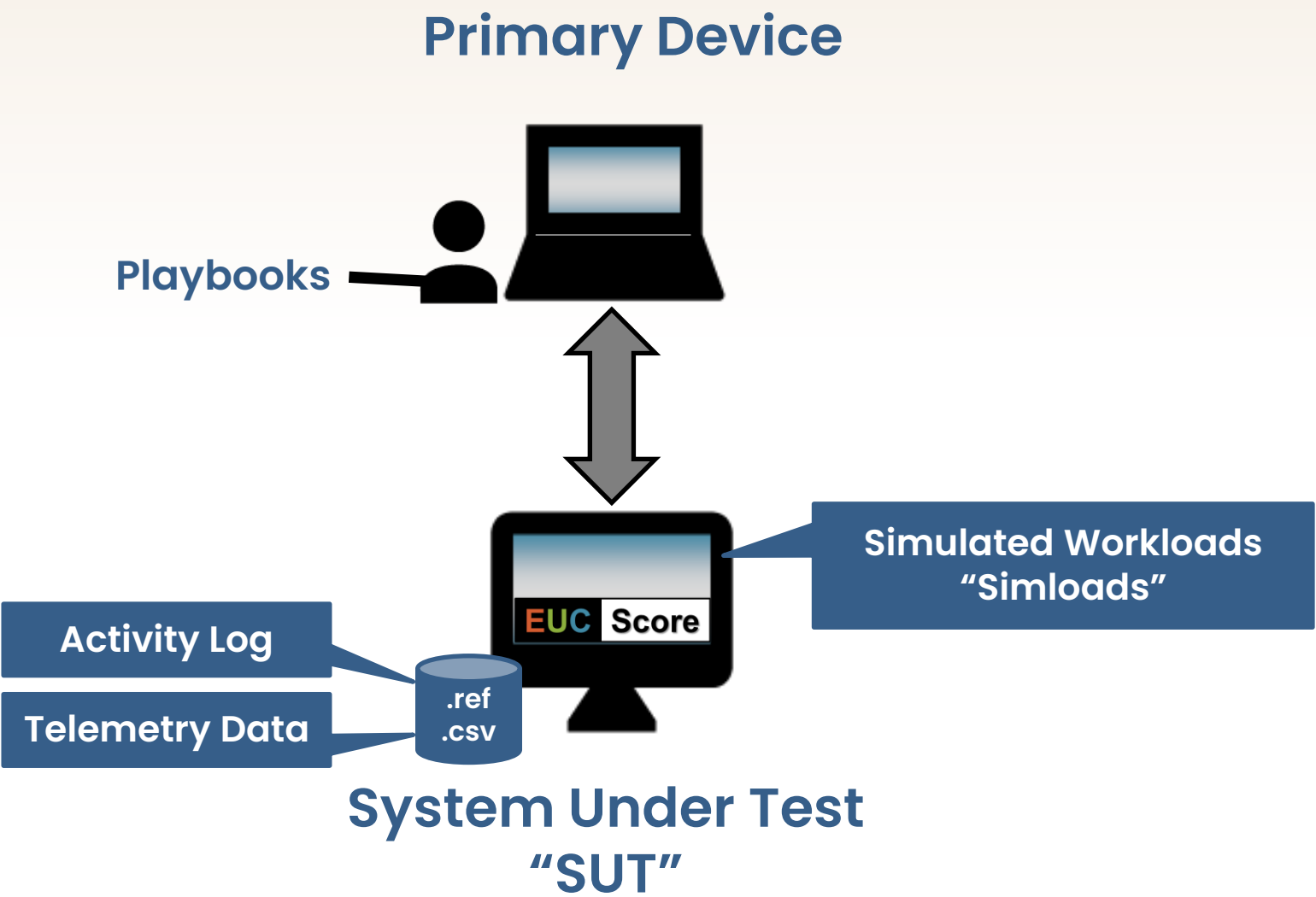
**User
Activities**



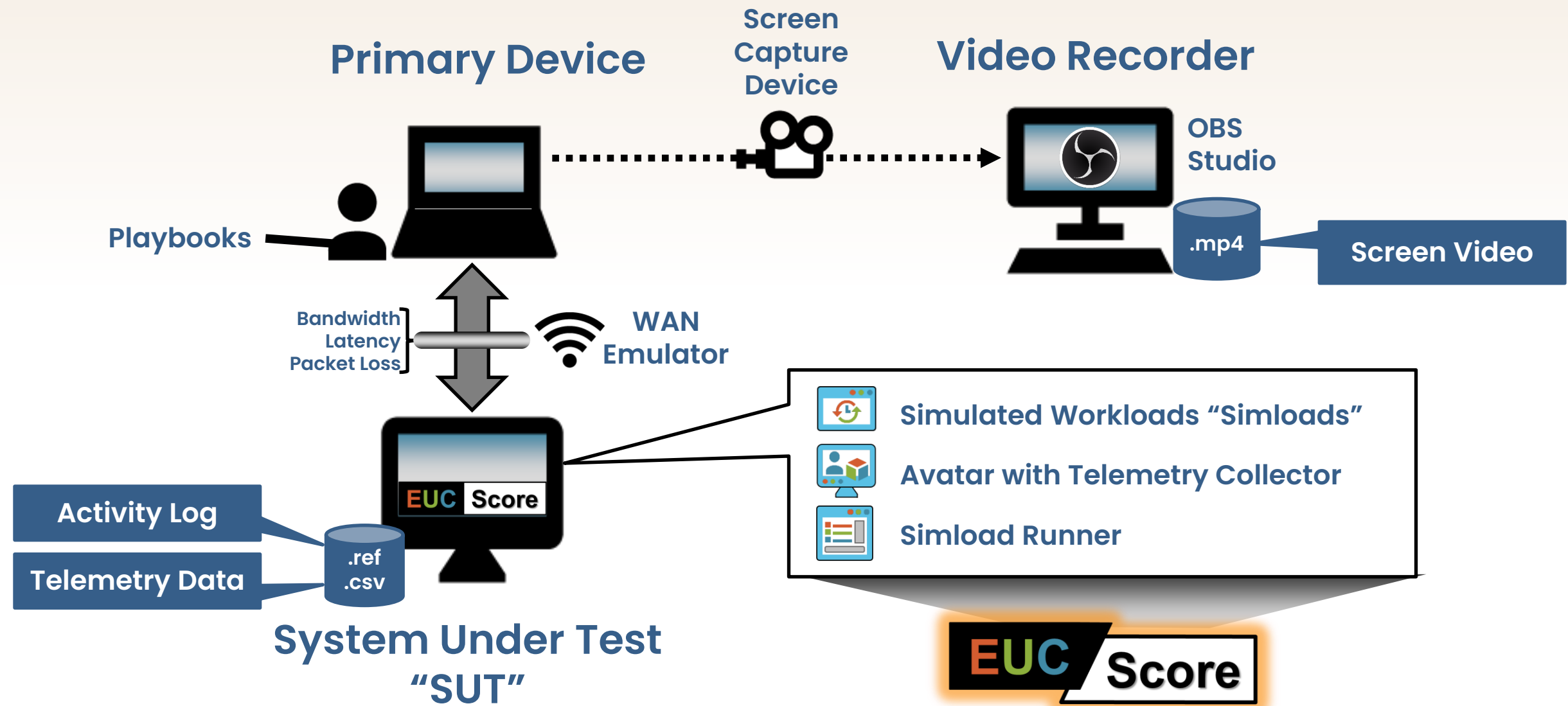
**Screen
Recording**

Scientific Data Analysis and Visualization

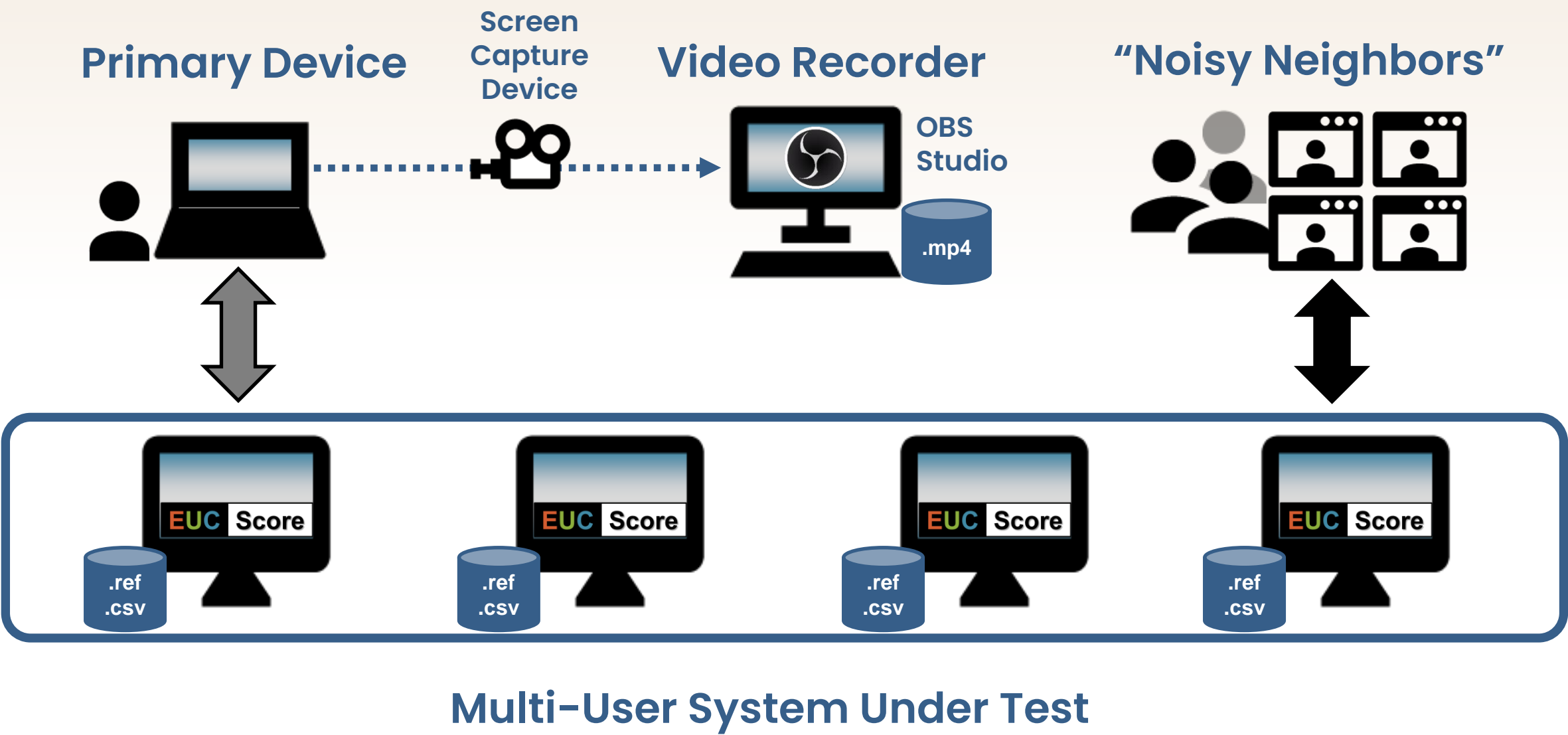
Setting Up a Simple Test Lab



Setting Up an Advanced Test Lab

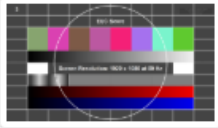







Setting Up a Multi-User Test Lab



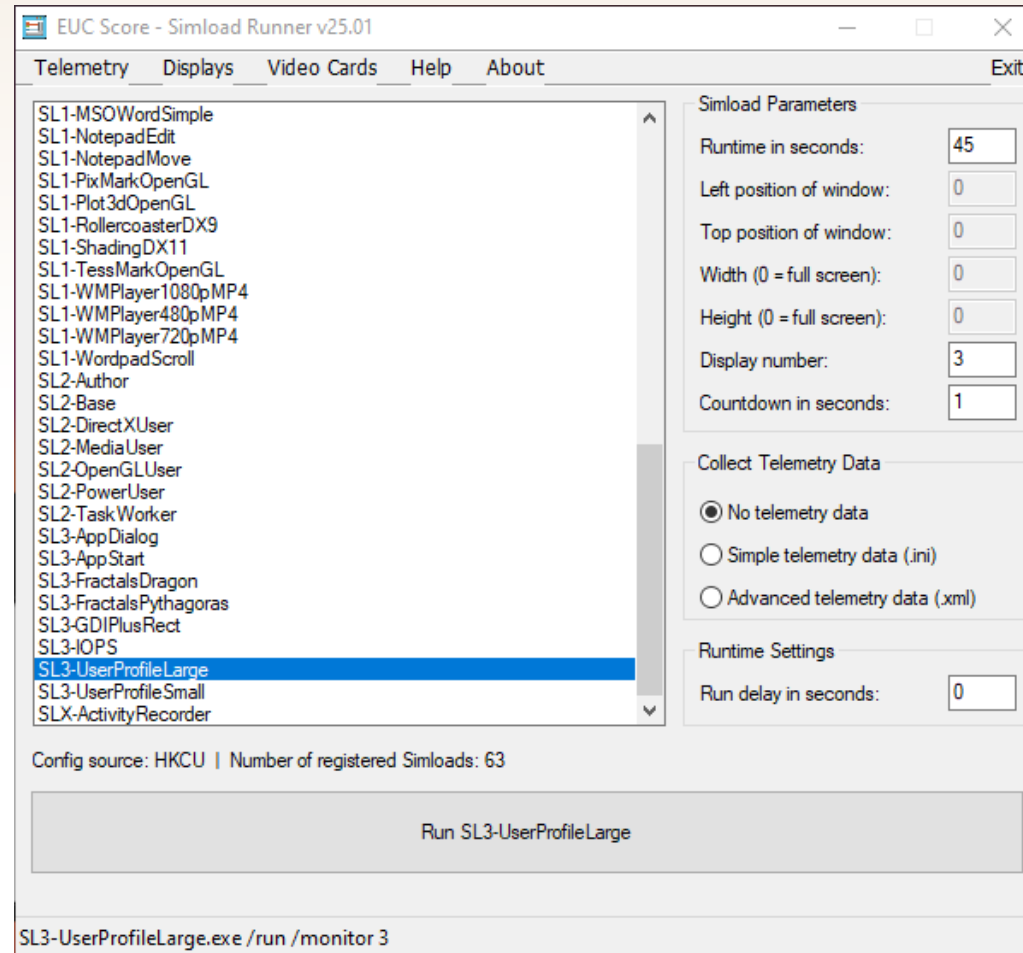
EUC Score Simload Gallery

<https://eucscore.com/gallery>

Thumbnail	Simload Type	Description
	System Light user type SL0-System folder	SL0-TestScreen Open an animated test pattern screen and save system information in the EUCScore\Results folder. The system information can be used to document the system under test.
	Primary Light user type SL1-Base folder	SL1-NotepadEdit Open Notepad2 and start writing a novel with random type speed. The Notepad2 executable is located in the EUCScore\Data\Bin\Notepad2\ folder.
	Primary Light user type SL1-Base folder	SL1-NotepadMove Open Notepad2 and move the application window randomly across the screen. The Notepad2 executable is located in the EUCScore\Data\Bin\Notepad2\ folder.
	Primary Light user type SL1-Base folder	SL1-WordpadScroll (deprecated) Open local DOCX file with PNG images in Microsoft Wordpad and randomly move pages up and down every second. NOTE: WordPad will be removed from all editions of Windows starting in Windows 11, version 24H2 and Windows Server 2025.
	Primary Light user type SL1-JPEGView folder	SL1-JPEGViewStatic Open JPEG image in JPEG View. The executable is located in the EUCScore\Simloads\SL1-JPEGView\Bin\JPEGView64\ folder. NOTE: This is the most basic Simload as it includes neither animations nor user interactions.
	Primary Medium user type SL1-JPEGView folder	SL1-JPEGViewAnim Open animated GIF image in JPEG View. The executable is located in the EUCScore\Simloads\SL1-JPEGView\Bin\JPEGView64\ folder.

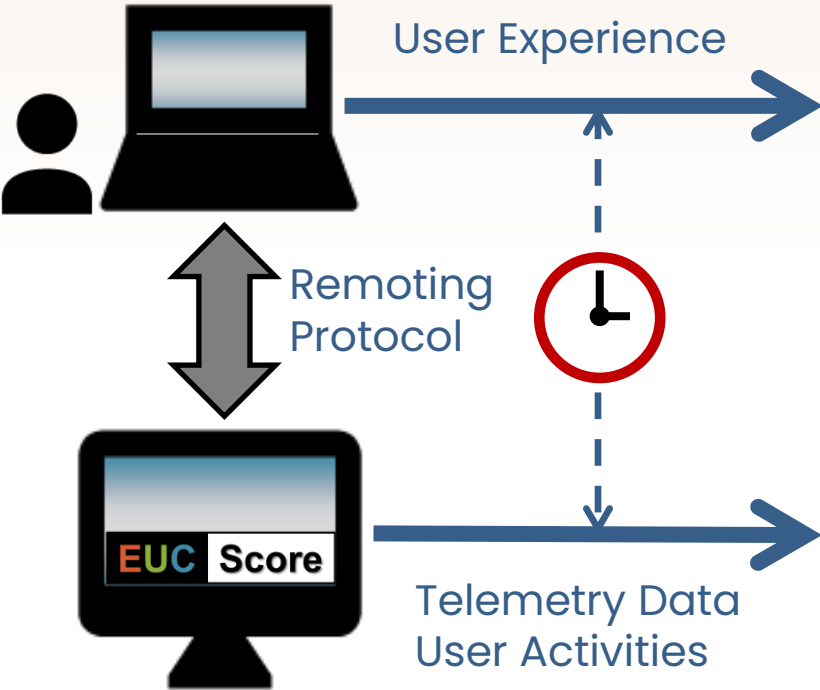
+ custom
or manual
Simloads with
real user
playbooks

Run Simloads and Collect Test Data



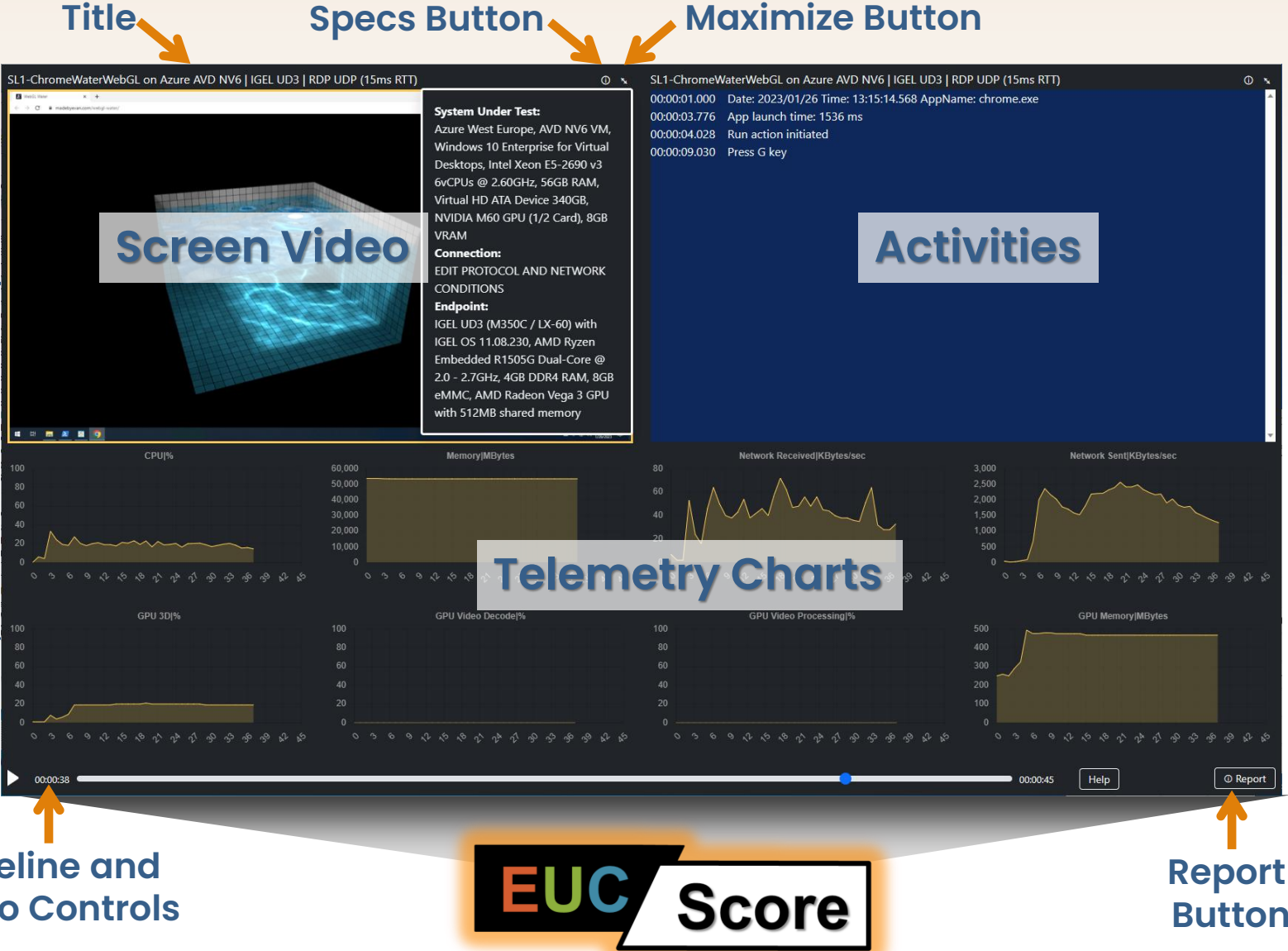
Sync Player

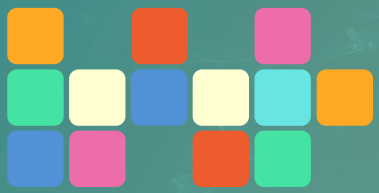
Primary User Endpoint



System Under Test

Timeline and Video Controls





Performance Tests and Comparisons

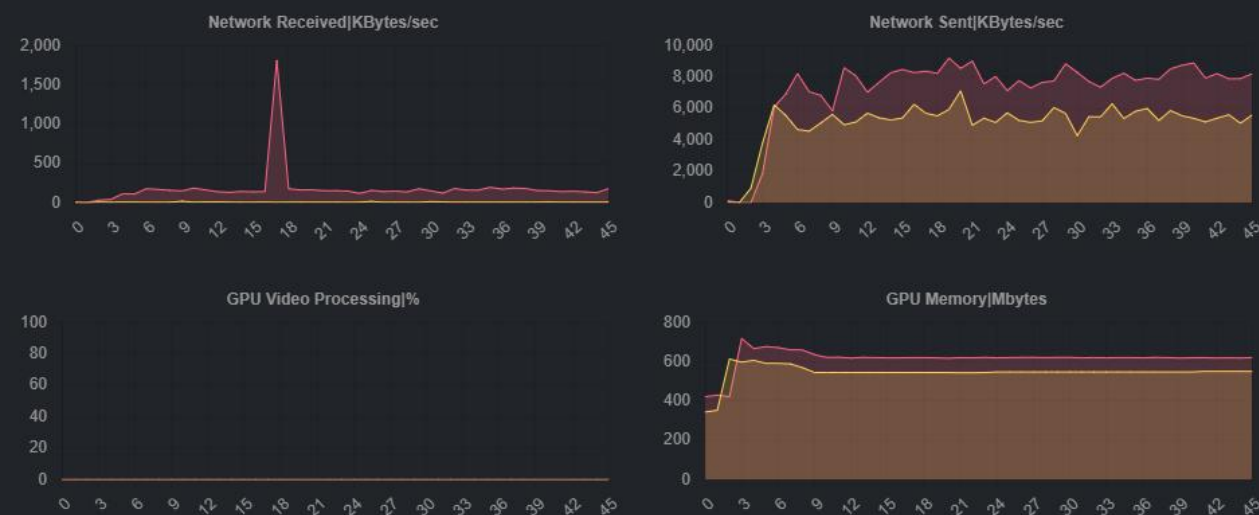
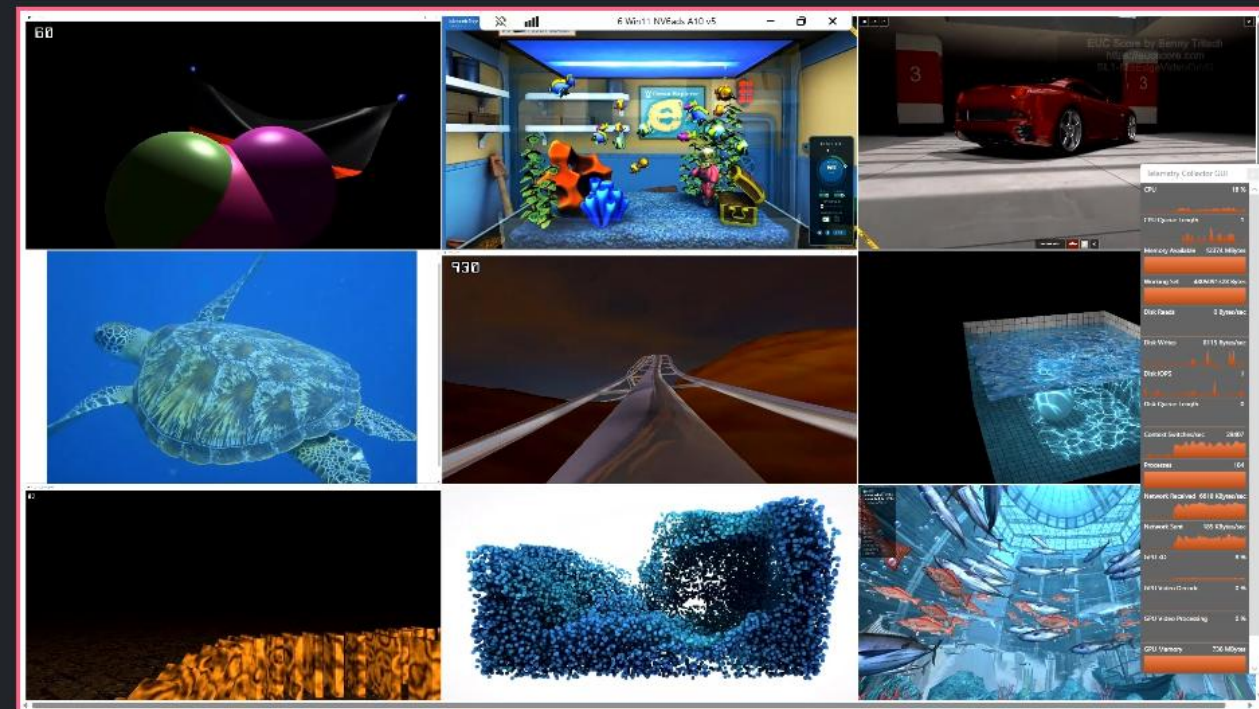
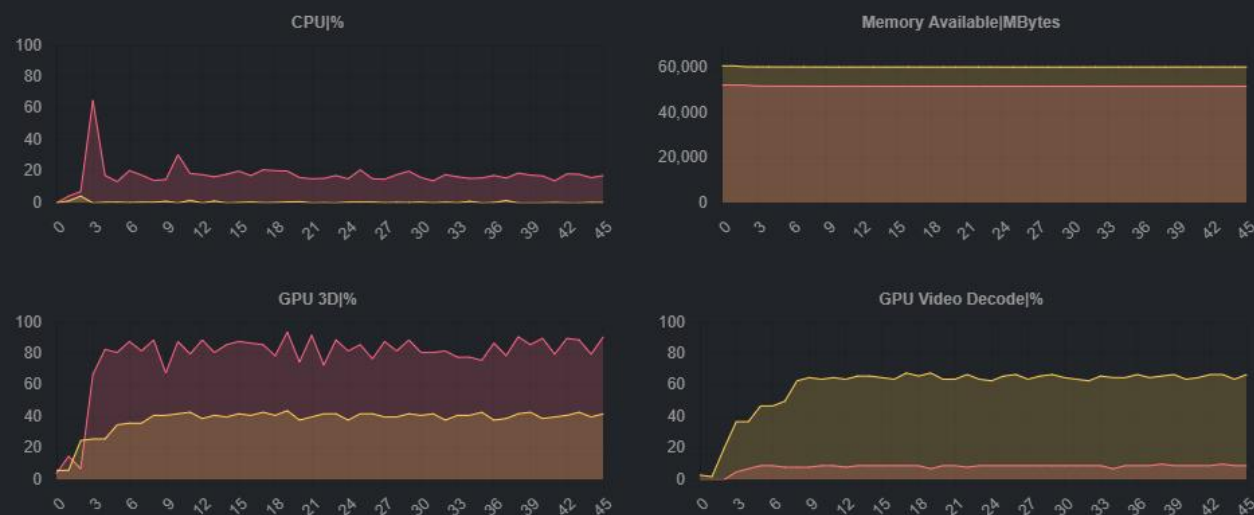
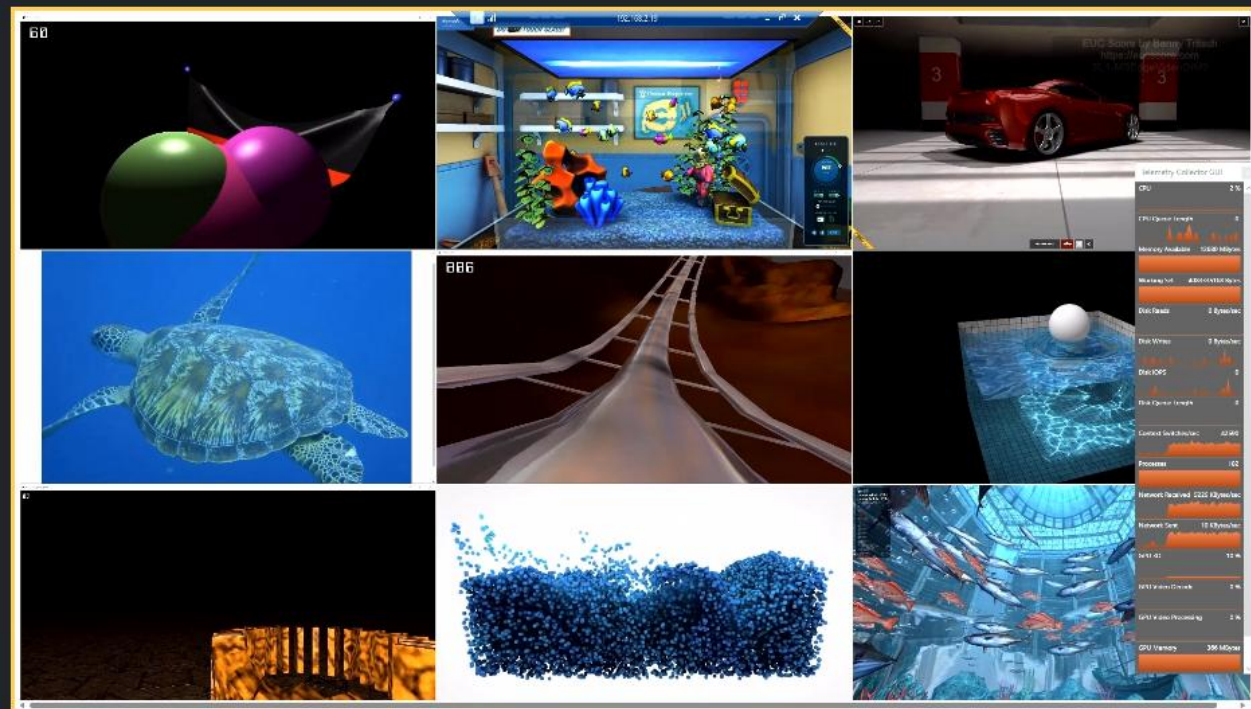


Simon's Field Tests



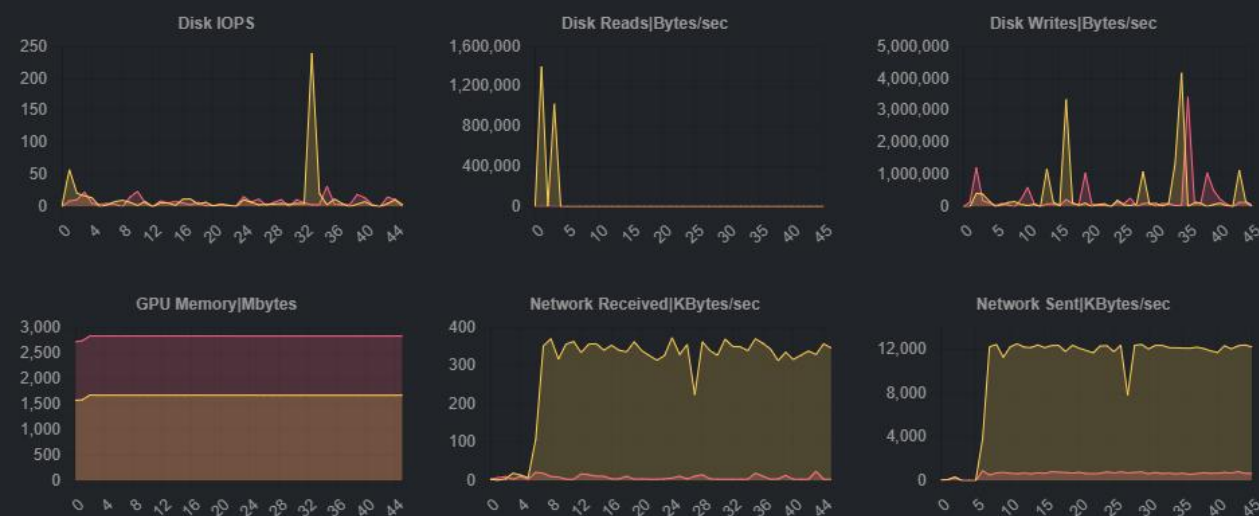
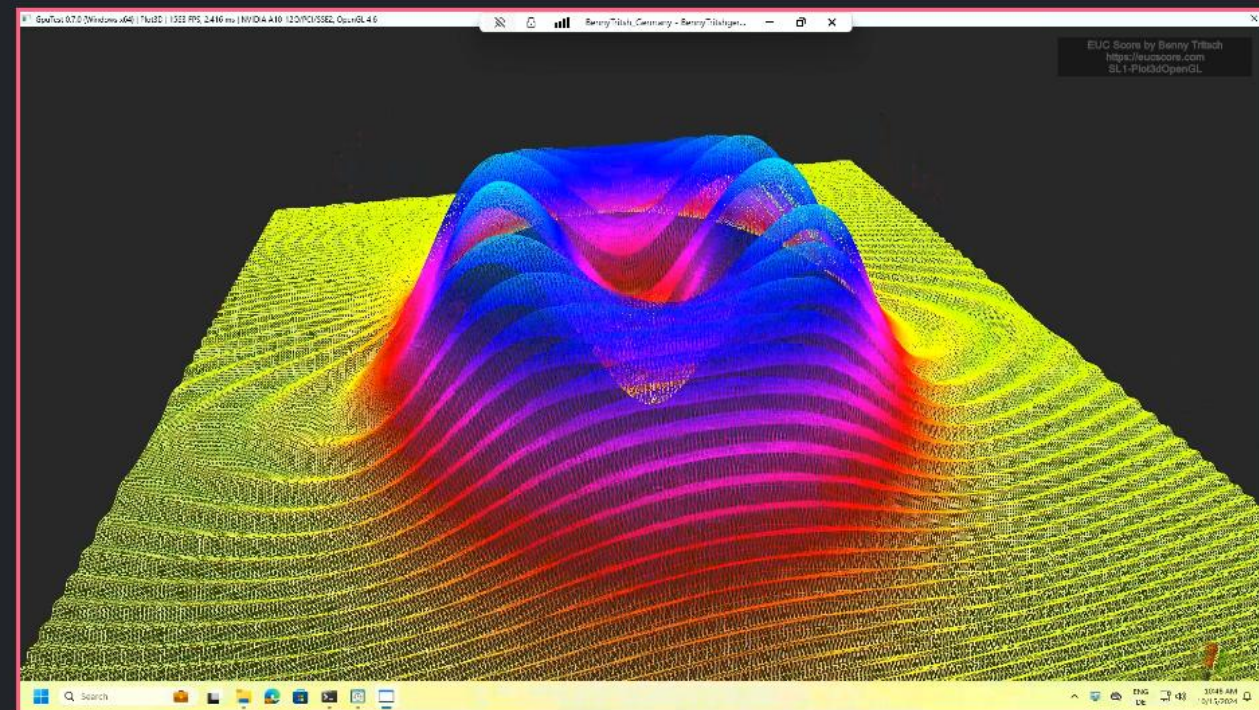
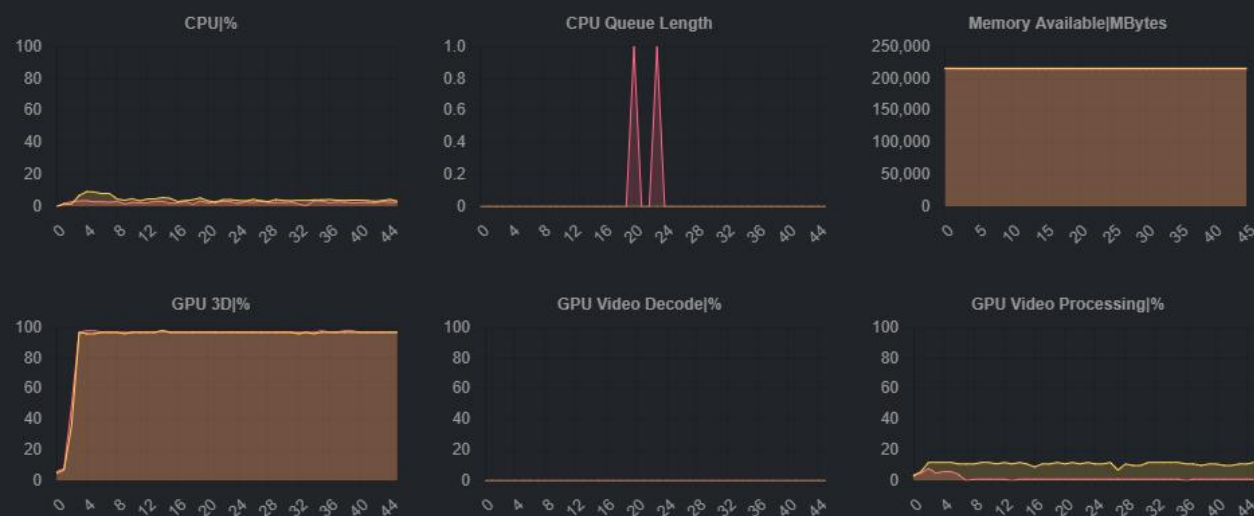
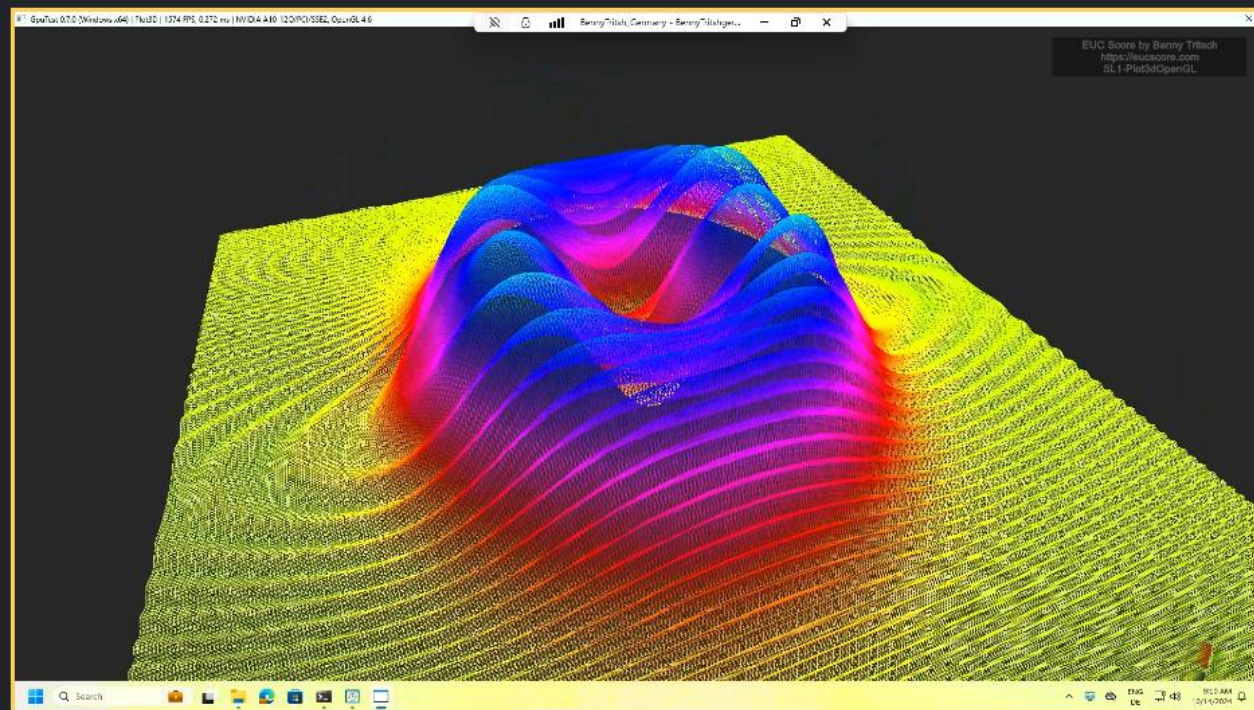
A low-angle, upward-looking photograph of several palm trees. The fronds are dark green and silhouetted against a sky that transitions from a deep teal on the left to a bright yellow on the right, suggesting a sunset or sunrise. The text is centered horizontally across the middle of the image.

Can an Azure VM beat a physical PC?



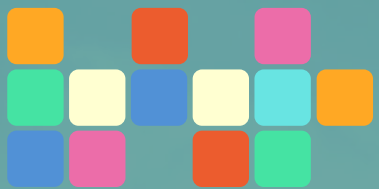


What is the impact of network limitations on RDP?

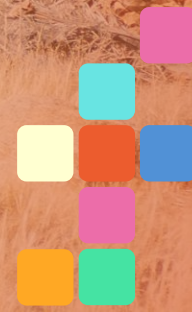


**Does a GPU always boost
performance?**











Findings and Recommendations



Test Findings

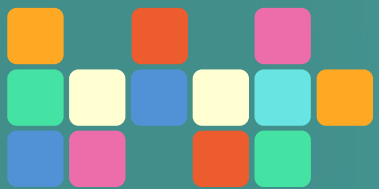
- Cloud Workstations beat 2–4-year-old CAD/CAM workstations...
- ...but a Cloud Workstation cannot beat a modern physical Workstation in performance, as the GPUs in the Cloud are 1 to 2 years behind and CPUs have a lower clock speed
- GPU-accelerated VM types are approx. factor 1.5 to 2 more expensive than comparable CPU-only VM types, but in multi-session setups scalability may be better
- Availability of GPU-accelerated VM types in Azure is a challenge
- If the network conditions are bad (<12mbps, >40ms latency, >1% packet loss) even the best Azure VM cannot deliver adequate user experience

Persona to VM Type Mapping

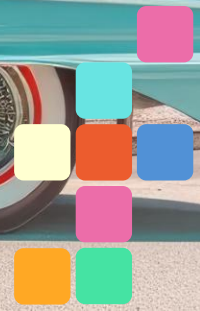
	Persona Name	VM Specs		Network		VM Types
	Task Worker	CPU Memory GPU	2-4 vCPUs minimum of 2GB no	Bandwidth Latency Packet loss	low 0-200ms 0-2%	Win365 Basic or Standard Azure D2s_v5, D2ads_v5
	Information Worker	CPU Memory GPU	2-4 vCPUs minimum of 4GB no	Bandwidth Latency Packet loss	low 0-100ms 0-1%	Win365 Standard or Premium Azure D4s_v5, D4ads_v5
	Knowledge Worker	CPU Memory GPU	4-8 vCPUs minimum of 8GB no or shared	Bandwidth Latency Packet loss	medium 0-50ms 0-0.5%	Win365 Premium or GPU Standard Azure D8s_v5, D8ads_v5 NG8ads_V620_v1
	Power User	CPU Memory GPU	4-16 vCPUs minimum of 16GB shared or dedicated	Bandwidth Latency Packet loss	medium 0-50ms 0-0.1%	Win365 Premium+ or GPU Standard Azure D16s_v5, D16ads_v5 NG16ads_V620_v1, NC4as_T4_v3
	CAD/CAM Designer	CPU Memory GPU	8-16 vCPUs minimum of 16GB high-end	Bandwidth Latency Packet loss	high 0-20ms 0%	Win365 GPU Super or GPU Max Azure NG16ads_V620_v1 NC8as_T4_v3, NC16as_T4_v3
	Media Designer	CPU Memory GPU	8-16 vCPUs minimum of 16GB high-end	Bandwidth Latency Packet loss	very high 0-30ms 0%	Win365 GPU Super or GPU Max Azure NG16ads_V620_v1 NC16as_T4_v3, NC16as_T4_v3

AVD and Windows 365 Recommendations

- Use Dsv5 machines instead of v3, they provide 25% better performance at a lower price
- The Azure D4s_v5 and D8ads_v5 VM types are my personal favorites for Information Worker and Knowledge Worker single-session scenarios
- Azure NC8asT4 – if you don't need the vCPUs or RAM, then go for the NC4asT4 – same GPU; SPEC performance almost the same, but 30% cheaper
- Azure NV6adsA10 provides more CPU and RAM at the same price as the NC4asT4
- NC4asT4/NC8asT4 provide better GPU performance because of full GPU vs GPU partition, but missing certification for CAD applications may be a deal breaker
- GPU-enabled Windows 365 Cloud PCs provide outstanding performance, but protocol settings can make a big difference



Conclusion



Conclusion

1. Don't walk in the dark: Test labs and guided POCs are your friends
2. Ask simple and clearly defined questions that can be answered by experiments (the "MythBusters" principle)
3. Follow and trust the scientific process, but don't underestimate the time and effort it may take (reproducibility, peer reviews)
4. Both quantitative (= scores) and qualitative data are the prerequisite for a rating produced by an expert or by an analyst
5. Human intervention is an integral part of the rating process

Call to Action

If you want to learn more about
EUC Score, send me an email

info@eucscore.com



NOTE: The EUC Score toolset is freely available for community benchmarking tests if the results are made available to the public free of charge

EUC Score Links

- Home page:
<https://eucscore.com>
- Freeware download:
<https://eucscore.com/freeware>
- Community test results:
<https://eucscore.com/results>
- Toolset documentation:
<https://docs.eucscore.com>
- Test Methodology:
<https://eucscore.com/methodology.html>
- Simload Gallery:
<https://eucscore.com/gallery.html>
- Terminology (Glossary):
<https://eucscore.com/terminology.html>
- Lab Equipment:
<https://eucscore.com/equipment.html>

Contact Us



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Creator of the EUC Score Toolset

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Thank you

