

EUC Score
Benchmarking Dizzion
Frame Remoting Protocol (FRP)

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From Lag to Lightning:

Independent Benchmarking of
Dizzion Frame Remoting Protocol vs Microsoft RDP vs Citrix HDX

D I Z Z I O N



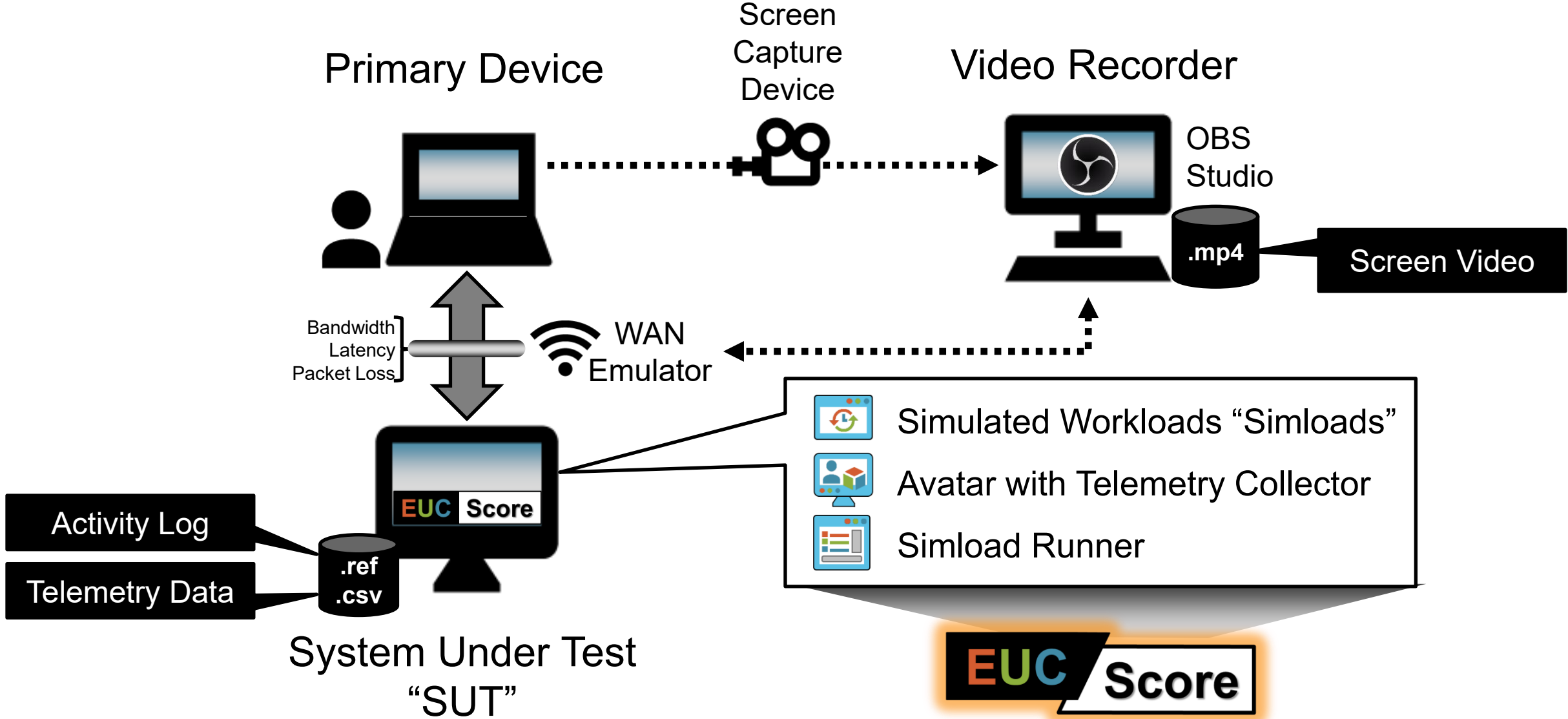
IBM Cloud

EUC Score



EUC Score Test Lab

EUC Score Enterprise Test Lab



Systems Under Test – VM Profiles

- **Dizzion Cloud PC:** Azure Germany West Central, D8s v5 VM type, Windows 11 Enterprise, 8 vCPUs (Intel), 32GB RAM, 128GB storage, connected to Google Chrome via FRP
- **Microsoft Remote Desktop (Classic RDP):** Azure Germany West Central, D8s v5 VM type, Windows 11 Enterprise, 8 vCPUs (Intel), 32GB RAM, 128GB storage, connected to MSTSC via RDP
- **Citrix Cloud PC (Windows 365):** Azure Germany West Central, Citrix for Windows 365, Windows 11 Enterprise, 8 vCPUs (Intel), 32GB RAM, 128GB storage, connected to Citrix Workspace App via EDT / HDX Adaptive Transport Protocol

- Account
- EUCScore-EU1

- Summary
- Sandbox**
- Updates 1
- Utility Servers
- Launchpads
- Users
- Capacity
- Analytics
- Audit Trail
- Sessions
- Notifications
- Tasks
- Settings
- VMs

- Documentation
- Support
- Platform Status

Sandbox 📄
Not published



Powered Off

Region
Azure, Germany West Central

Availability Zone
multi

IP
Not available

Version
9.4.5.0

OS Build
Microsoft Windows 11 Pro version: ...

Machine Image Name
Not available

Instance Type [Change Instance Type](#)
Edge 32GB (D8s v5) 8 vCPU | 32 RAM

Disk Size [Increase Disk Size](#)
127 GB

Shutdown Timeout [Change Timeout](#)
60 minutes

- Actions**
- [Change Session Settings](#)
 - [Reset Master Image](#)
 - [Clone Sandbox](#)

Publish

Not published

Backups 📄

1 backup | Last backup on Sep 4th 2025 09:13 UTC

[Create Backup](#) ⋮

Name	Created At	Type
Manual Backup	Sep 4th 2025 09:13 UTC	M ⋮

Applications

12 onboarded applications

🔍 Search applications...

Icon	Name	
	Access	⋮
	Adobe Acrobat	⋮
	Excel	⋮
	Frame Explorer	⋮
	Google Chrome	⋮
	Notepad	⋮
	OneDrive	⋮

Session Assignment

- Access to Dizzion admin console and Cloud PC from the Chrome browser and within minutes
- Simple and fast setup, cloning of VMs and creation of new accounts
- Easy session configuration
 - Clipboard integration
 - Camera and microphone integration
 - USB redirection
 - 4K display
 - Video quality, YUV444

The screenshot displays the Dizzion admin console interface. The top navigation bar shows the breadcrumb path: DIFR > Ruben Spruijt > EUCScore-EU1 > Sandbox. The main content area is divided into several sections:

- Sandbox:** A central window shows a Windows 11 desktop with the text "Windows 11 Running". Below the window is a "Powered On" toggle switch and a "Start Session" button.
- Region:** Azure, Germany West Central
- Availability Zone:** multi
- IP:** 131.189.87151
- Version:** 9.4.5.0
- OS Build:** Microsoft Windows 11 Pro version: ...

Below the session controls is a "Backups" section with a table listing backup information:

Name	Created At
Manual Backup	Sep 4th 2025 09:13 UTC

The left sidebar contains a navigation menu with items: Account (EUCScore-EU1), Summary, Sandbox (highlighted), Updates, Utility Servers, Launchpads, Users, Capacity, Analytics, Audit Trail, Sessions, Notifications, Tasks, Settings, and VMs. The bottom of the screen shows a Windows taskbar with the Start button, Search bar, and various application icons.

- Basic Info
- General
- Session**
- Session Sharing
- Networking
- Disaster Recovery
- Profiles
- Personal Drives
- Domain Settings
- Notifications
- Deployment Group
- Shutdown Timeout

- Account
- EUCScore-EU1**
- Summary
- Sandbox
- Updates EA
- Utility Servers
- Launchpads
- Users
- Capacity
- Analytics
- Audit Trail
- Sessions
- Notifications
- Tasks
- Settings**
- VMs
- Documentation
- Support
- Platform Status
- 3.88.0

Features

- Clipboard Integration
- Clipboard Direction Bidirectional
- App Switching
- Download
- Upload
- Print
- Camera
- Microphone
- USB Redirection
- 4K Displays (Non-GPU)
- Audio playback on session start

Network

- Max Frame Rate
5
60
30 | fps
- Max Video Bit Rate
0.256
64
64 | Mbps
- Enable YUV444
- Allow Users to Change These Settings

Time Limits

- User Inactivity Timeout
-
120 | min
+
- Idle Timeout
-
60 | min
+
- Enable Max Session Duration
- Reservation Timeout
-
600 | sec
+
- Session Preparation Timeout
15
60
15 min

Keyboard profiles

Name	Language
Default	-



Recycle Bin



Avatar



Simload Runner



RemoteDis...



6 ms 100% 1352 kbps 4 fps 30:01 HQ

Remote Display Analyzer
Licensed To: Bernhard Tritsch

Running for: frame
SessionID: 1

Virtual Channel Display mode

Windows 11 Pro 24H2
Frame Session ID: maYgDGZB3ZxPB
Frame Server Version: v9.4.5.0
Frame Guest Agent: v2.4.2.0
Frame Protocol: FRP8
Connection Type: UDP
Display Resolution: 1920x1080
Video Encoder Type: FFmpeg
Video Codec Type: H264
Video Display Type: DXGI

Other Statistics

Average Frame QP: 12
Send Queue Size: 0
vBV Buffer Size: 7123200
Maximum Audio Bitrate: 160
Maximum Video Bitrate: 47488
Luma and Color model (YUV): YUV444

System CPU Usage: 5 %
System CPU Frequency: 2.79 GHz
System CPU Queue Length: 0

Total Statistics

Total Bandwidth Usage: 36 Mbps
Average Bandwidth Usage: 211 Kbps
Total Framerate: 809 FPS
Average Framerate: 5 FPS
Average System CPU Usage: 7 %
Total System CPU Queue Length: 16

Real-Time Statistics

Framerate: 4 FPS
Maximum Framerate: 30 FPS
Network Latency: 6 RTT
Available Bandwidth: 48 Mbps
Bandwidth: 151 Kbps

Exit Less 2:55 GPU

Task Manager

Performance

CPU 6% 3.20 GHz
Memory 5.9/32.0 GB (18%)
Disk 0 (C:) HDD (SAS) 1%
Ethernet Ethernet 3 S: 296 R: 8.0 Kbps

CPU Intel(R) Xeon(R) Platinum 8370C CPU @ 2.80GHz

% Utilization 100%

Utilization 6% Speed 3.20 GHz Base speed: 2.79 GHz Sockets: 1 Virtual processors: 8 Virtual machine: Yes L1 cache: N/A

Processes 197 Threads 2532 Handles 87154

Up time 0:00:31:13

Session Stats

codec: 0
encoder: CPU
capture: DXGI
video buffer size: 10

resolution: 1920x1080
framerate: 4
zoom: 100
decode time: 3
frames dropped: 0
packets lost: 534
packets received: 68073
packets lost %: 0.78
pli count: 22
sli count: 0
avg rtp ivl: 0
fec packets discarded: 0
fec packets received: 0
fir count: 0
nack count: 903
packets duplicated: 0
packets failed decryption: 0
qp sum: 54630
jitter: 0
jitter buffer delay: 0

audio sample rate: 48000
audio encode time: 0

current bitrate: 1352
latency: 6
server distance[m]: 4789

max video bitrate: 47488
max audio bitrate: 160
capture framerate: 30
encoder framerate: 30
allocated bandwidth: 47675

protocol: FRP8
connection type: UDP
version: v7.5.3rc11

Copy debug info
Refresh stream

Telemetry Collector GUI

Memory Available 26638 MBytes
Working Set 7651364864 Bytes
Disk Reads 0 Bytes/sec
Disk Writes 4066 Bytes/sec
Disk IOPS 1
Disk Queue Length 0
Context Switches/sec 10277
Processes 197
Network Received 4 KBytes/sec
Network Sent 77 KBytes/sec
Session CPU 5 %
FRP Average QP 12
FRP Capture FrameRate 30 fps
FRP FrameRate 4 fps
FRP NetworkLatency 6 ms
FRP Bandwidth used 149 kbps
FRP Encoder Frame Rate 30 fps
FRP Estimated Bandwidth 675 kbps
FRP Max Framerate 30 fps
FRP Max Video Bitrate 47488 Kbps
FRP Max Video Quantization 32

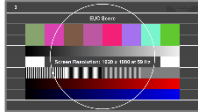


Search



Simulated Workloads

Simple / Continuous



TestScreen
System info



NotepadEdit
Simple typing



NotepadMove
Moving app window



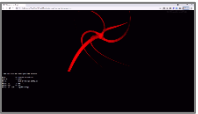
WordpadScroll
Office app scrolling



JPEGViewAnim
Simple animation



MSEdgeHtmlScroll
HTML doc scrolling



MSEdgeMonsterHTML5
Simple WebGL app

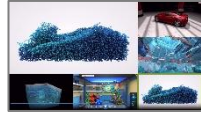
Videos / HTML5



WMPPlayer480MP4
480p MP4 video



WMPPlayer720MP4
720p MP4 video



WMPPlayer180MP4
1080p MP4 video



MSEdgeVideoConf4
4 separate videos



MSEdgeVideoConf6
6 separate videos

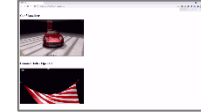


MSEdgeVideoGrid9
9 separate videos



MSEdgeFishbowHTML5
HTML5 app

Animations



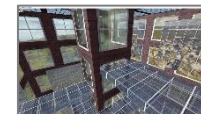
MSEdgeGifScroll1 / 2
Medium animation



MSEdgePhotoGalleryJS
JPG photo gallery



RollercoasterDX9
Medium DirectX 9 app



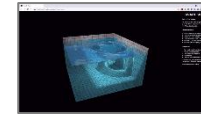
BSPBlendingDX11
Demanding DirectX 11 app



MSEdgeCarVisualizer
Demanding WebGL app

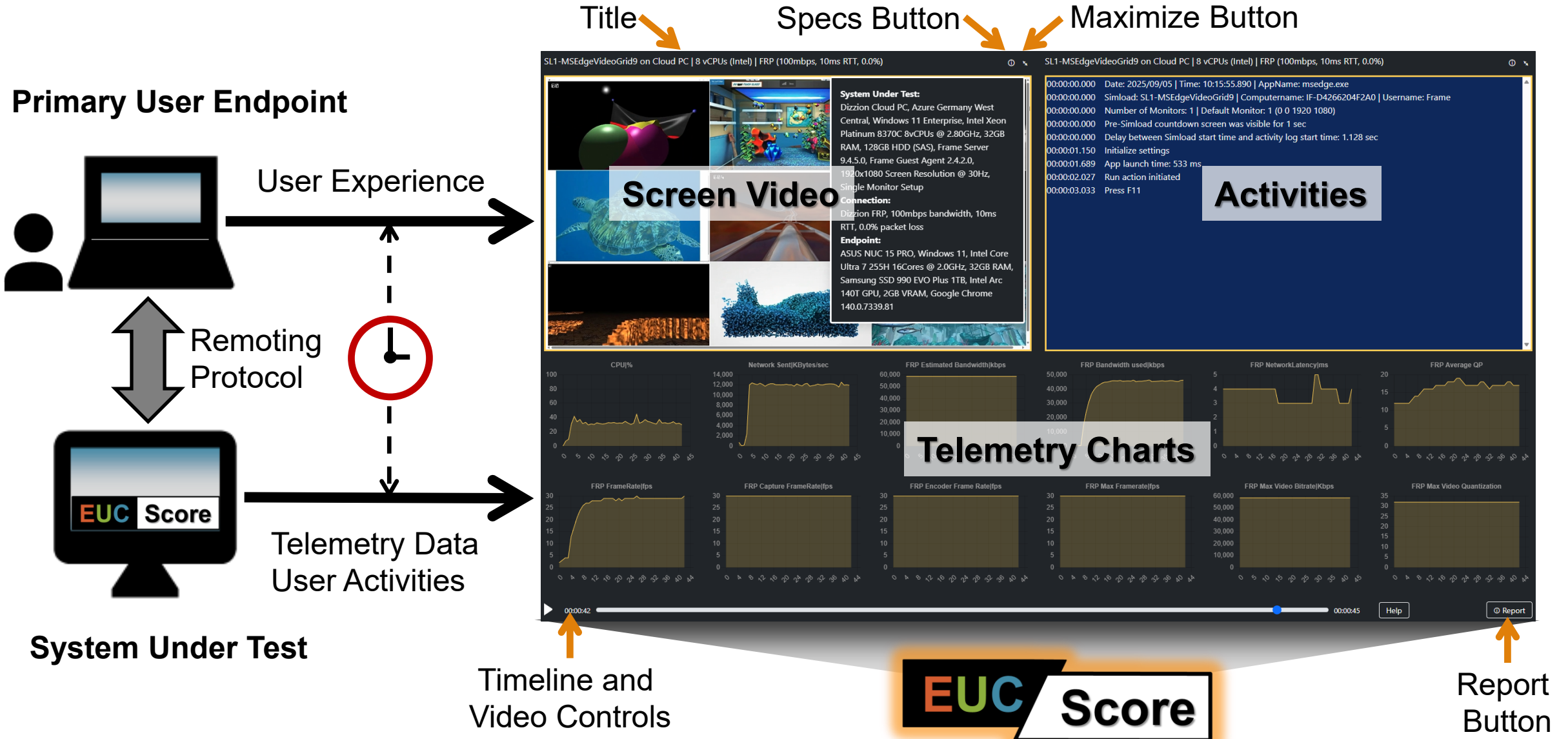


MSEdgeAquariumWebGL
Demanding WebGL app

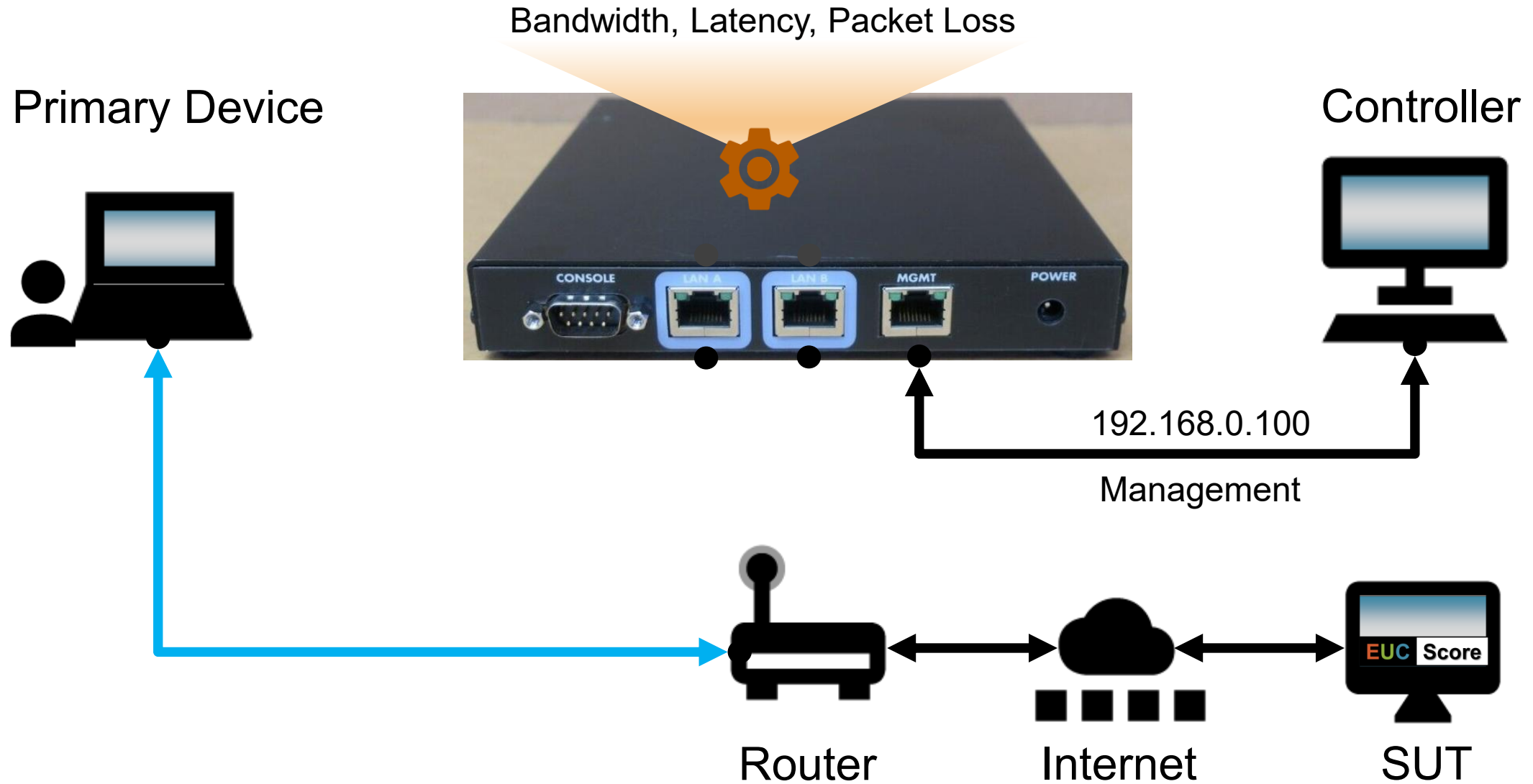


MSEdgeWaterWebGL
Demanding WebGL app

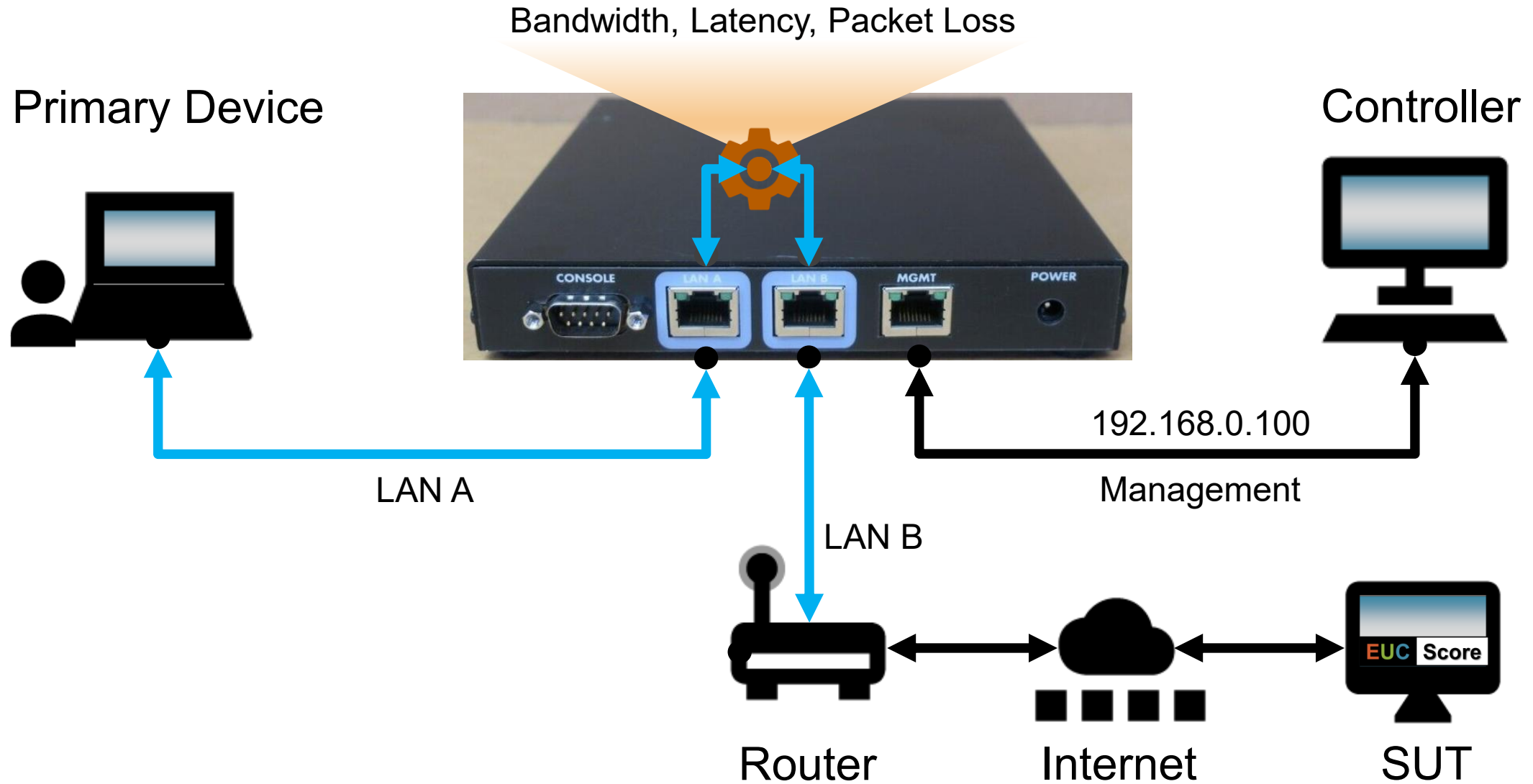
Visual Data Analytics – Sync Player



What is a WAN Emulator Used For?



What is a WAN Emulator Used For?





LINKTROPY MINI²

linktropy-mini2 (192.168.2.254)

Status	Rate	Drops
LAN A UP (100FD)	150.0 Kbps	53353
LAN B UP (100FD)	13.08 Kbps	17502

Emulation On/Off Refresh: 1s

- Link Emulation
- Bridge / Route
- Device Settings
- Save / Load
- Upgrade

	LAN A → LAN B	LAN B → LAN A
Bandwidth	<input type="text" value="100"/> Mbps	<input type="text" value="100"/> Mbps
Delay	<input checked="" type="radio"/> Constant <input type="radio"/> Uniform <input type="radio"/> Normal <input type="text" value="0"/> ms	<input checked="" type="radio"/> Constant <input type="radio"/> Uniform <input type="radio"/> Normal <input type="text" value="0"/> ms
Loss	Packet Loss <input type="text" value="0.0000"/> % BER <input type="text" value="0"/> x 10 ⁻¹⁴	Packet Loss <input type="text" value="0.0000"/> % BER <input type="text" value="0"/> x 10 ⁻¹⁴

Advanced Parameters [\[show\]](#) Apply Changes Clear Changes



Reset Refresh Interval: 1s

LAN A → LAN B

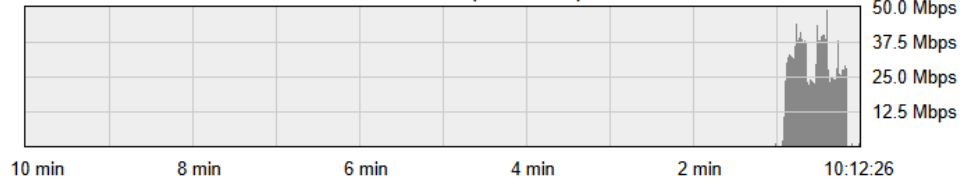
Rate: 100.0 Mbps Delay: 0 ms Loss: 0% BER: 0 Queue: 250 ms

Transmission Count		Drops				
Bytes	Frames	Loss	BER	Queue	Total	Percent
183,075,915	155,663	0	0	0	0	0.00%

Average Tx Rate

1 sec	1.287 Mbps
10 sec	3.205 Mbps
1 min	24.39 Mbps
10 min	----- bps

Transmission Rate (1s intervals)



LAN B → LAN A

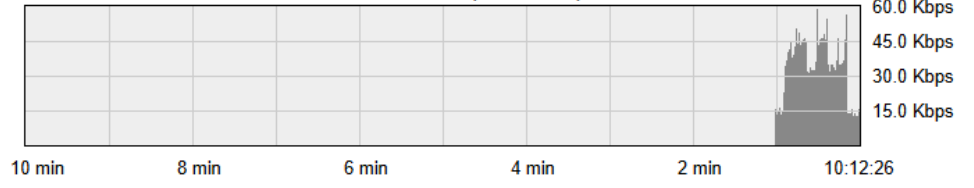
Rate: 100.0 Mbps Delay: 0 ms Loss: 0% BER: 0 Queue: 250 ms

Transmission Count		Drops				
Bytes	Frames	Loss	BER	Queue	Total	Percent
262,142	1,223	0	0	0	0	0.00%

Average Tx Rate

1 sec	16.09 Kbps
10 sec	18.45 Kbps
1 min	34.46 Kbps
10 min	----- bps

Transmission Rate (1s intervals)



Dizzion Benchmarking: Network Profiles

- **Baseline (Unconstrained):** 100 Mbit/s bandwidth limit, no added latency, no added packet loss
- **High packet loss:** 100 Mbit/s bandwidth limit, no added latency, 2.0% packet loss
- **High round trip time:** 100 Mbit/s bandwidth limit, 2 x 50ms latency added, no added packet loss
- **Low bandwidth:** 8 Mbit/s bandwidth limit, no added latency, no added packet loss
- **Very high packet loss:** 100 Mbit/s bandwidth limit, no added latency, 5.0% packet loss
- **Very high round trip time:** 100 Mbit/s bandwidth limit, 2 x 150ms latency added, no added packet loss
- **Very low bandwidth:** 2 Mbit/s bandwidth limit, no added latency, no added packet loss

Analysis FRP-RDP-HDX

Impact of
different
network
conditions on
the FRP
protocol

Comparison
between
Dizzion FRP
and Microsoft
RDP 11
(classic)

Comparison
between
Dizzion FRP
and Citrix HDX



Show Time

Key Findings

- Without network constraints, many workloads don't show a big visual difference between FRP, RDP11, and HDX
- In many cases, FRP shows better image and animation quality, but also requires more bandwidth than the other protocols
- In general, FRP is very good at compensating for packet loss
- With increasing latency, FRP shows good performance, but often requires more bandwidth
- Low network bandwidth does not pose a major problem for FRP

Call to Action

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

info@eucscore.com



<https://eucscore.com>

<https://eucscore.com/results>

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



EUC Score Links

<https://eucscore.com>



Home Page

<https://eucscore.com/freeware>



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- Toolset documentation: <https://docs.eucscore.com>
- Test Methodology: <https://eucscore.com/methodology.html>
- Simload Gallery: <https://eucscore.com/gallery.html>
- Test Results (Sync Player): <https://eucscore.com/results>
- Terminology (Glossary): <https://eucscore.com/terminology.html>
- Lab Equipment: <https://eucscore.com/equipment.html>

Thank You

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