

EUC Score

Simulated Workloads for Community Benchmarks

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Agenda

- Measuring Digital Employee eXperience (DEX)
- Test lab setup
- EUC Score toolset
- Some test results
- Call to action

Measuring Digital Employee Experience

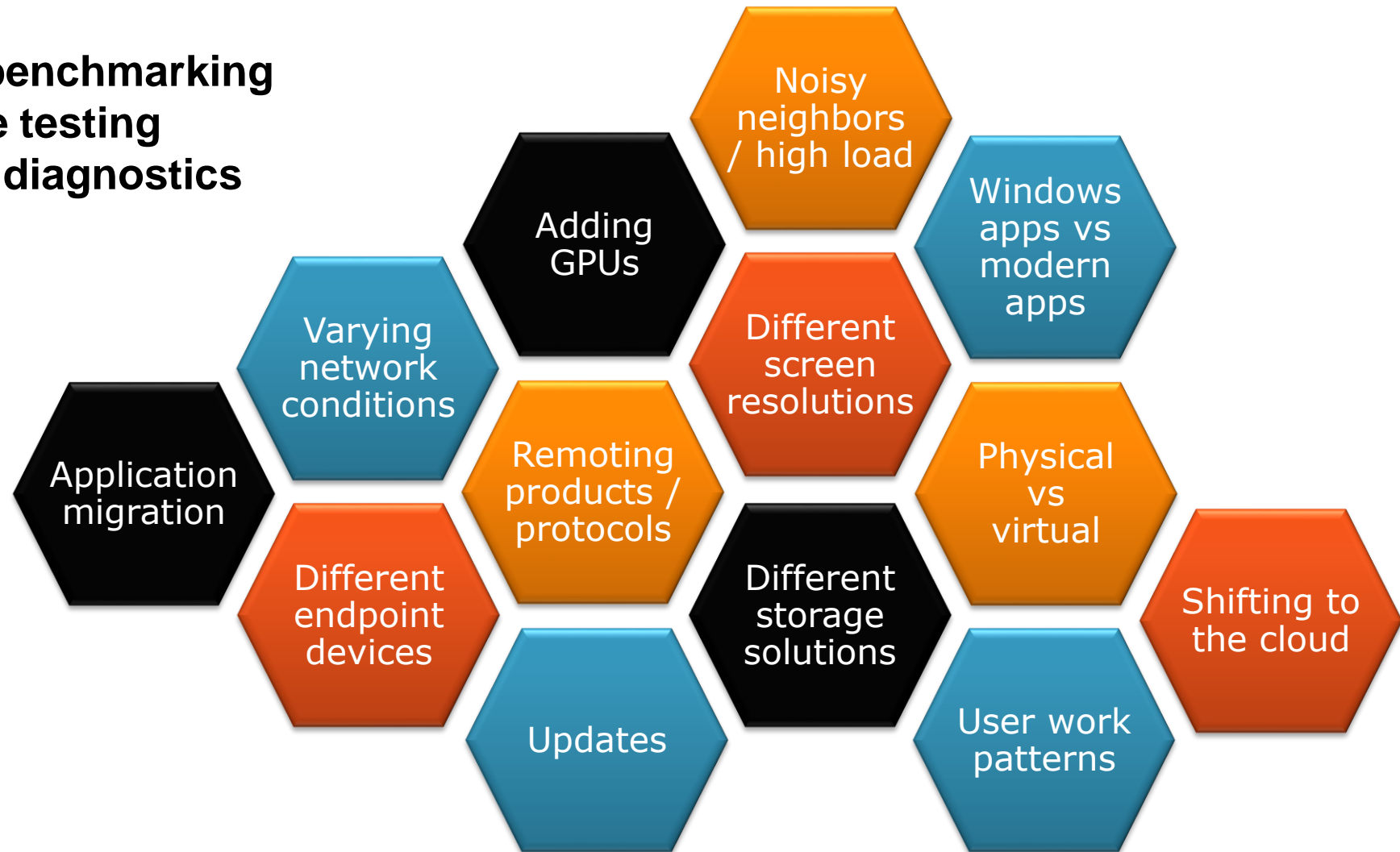
A typical EUC performance benchmarking (or Myth Busters) project flow can be separated into three phases:

1. **Design**: Pose a testable question, state a hypothesis, setup a test environment and design an experiment
2. **Perform**: Perform controlled and reproducible experiments and collect test data (NOTE: lab experiments or simulations may not reflect the real world, but they help us to understand certain aspects of the real world)
3. **Analyze**: Review test results, visualize data, draw conclusions and publish findings (and sometimes re-design the experiment and start all over again)

Testable Questions

EUC Score Scope

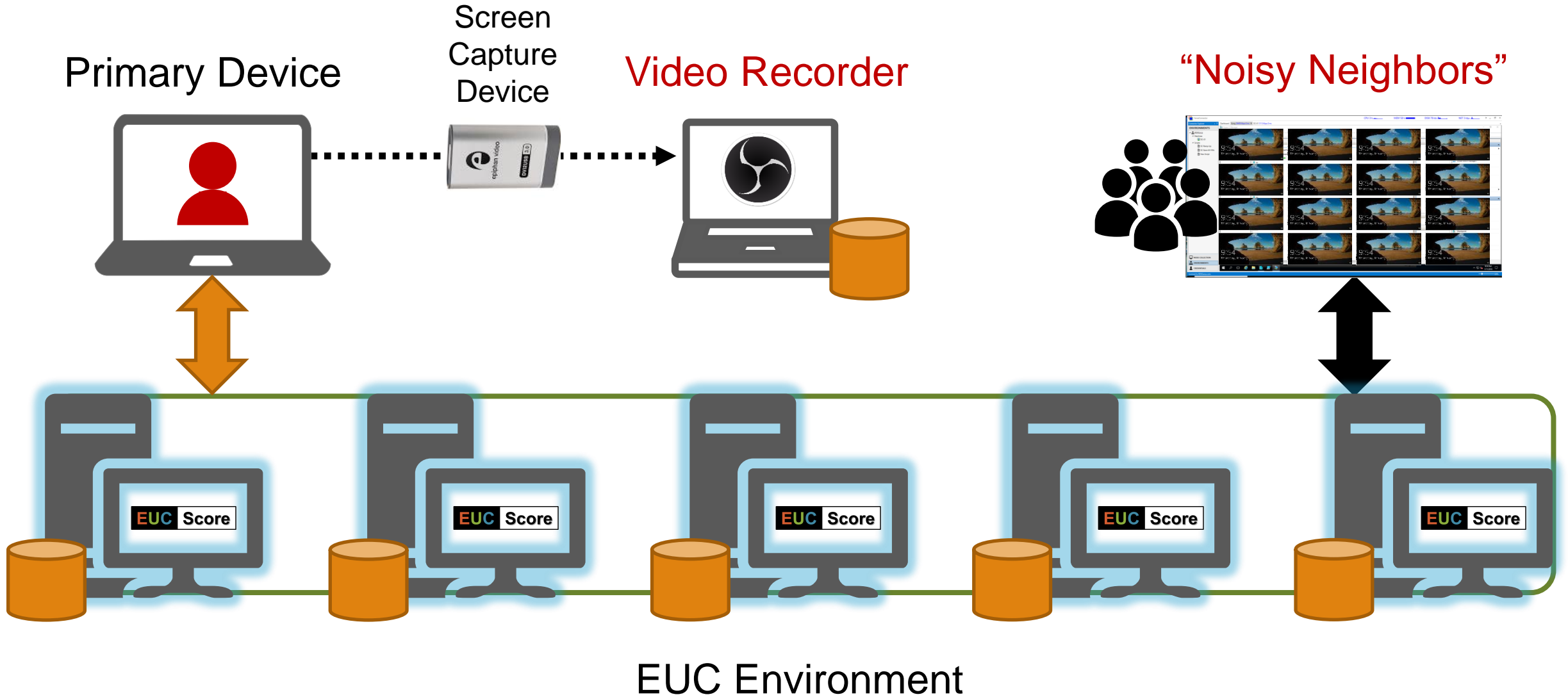
- Pre-production benchmarking and performance testing
- Ad-hoc systems diagnostics and analysis





Designing an EUC Score Lab

EUC Score Lab



EUC Score Modules

- Simulated Workloads “SimLoads”
- Startup SimLoad
- SimLoad Runner
- Telemetry Tracker & Collector
- Screen Video Recorder
- Data Analyzer and Visualizer
- + OOB tools + PowerShell
- + QuickLaunch, Remote Desktop Plus, Horizon Direct Connect, ...

Let's take a look under the surface...



SimLoad Specs

Each SimLoad is a compiled executable with cmd interface

- Foreground: *Run <SimLoad>*
- Background: *Start/Stop*
- Side-by-side .ini file
- Registered: **[HKLM/HKCU]**
\Software\Simloads\Simloads
- Temporary object in *HKCU*
\Software\Simloads\Temp
- **Copy&Paste installation**
- Creates .ref file – user actions

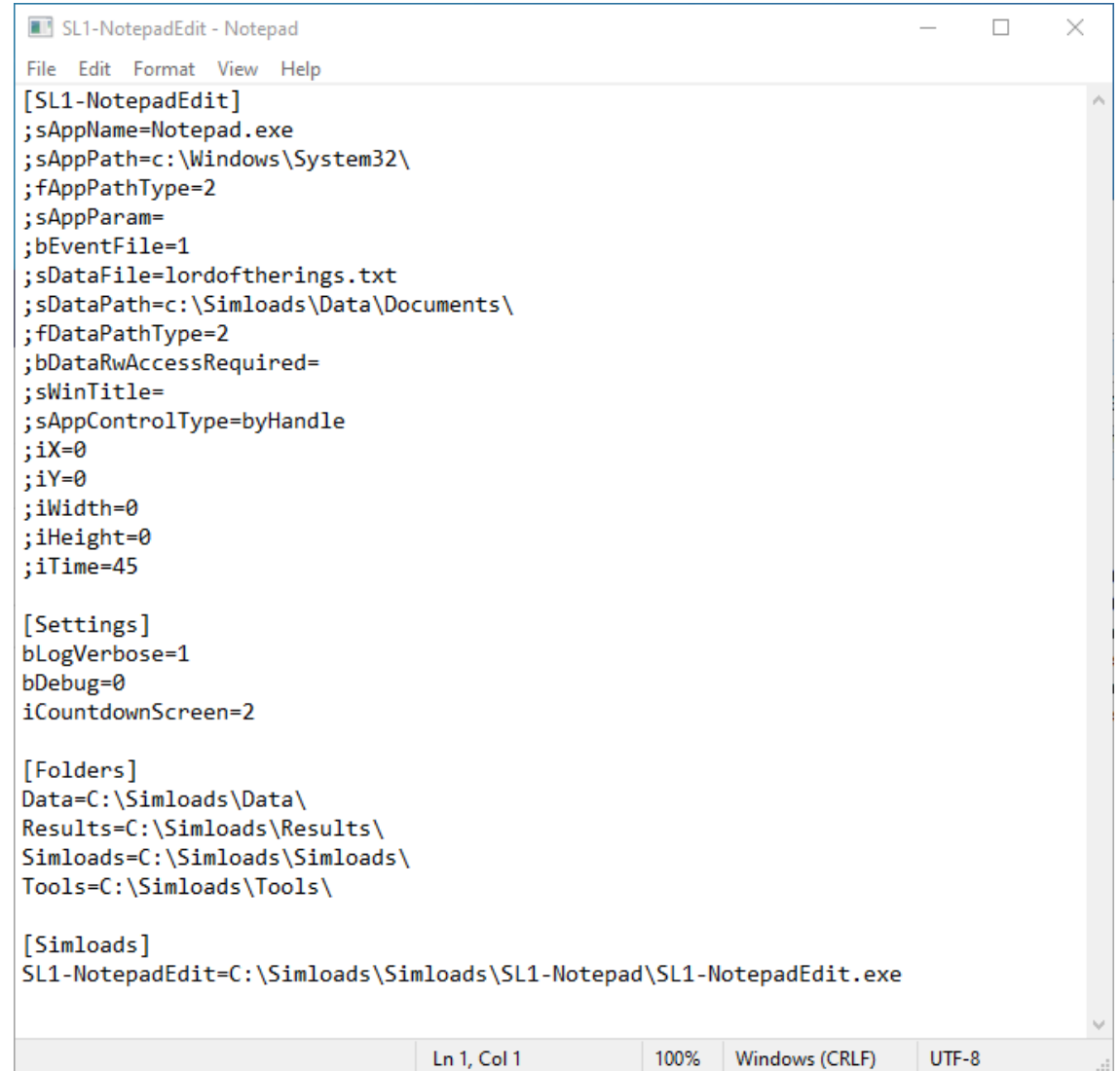
<https://eucscore.com/simloads.html>

sSimloadName	Name of the simload stored in the temporary object
sStartDate	Start date, format YYYY/MM/DD
sStartTime	Start time, format HH:MM:SS
sAppName*	Application executable name, including extension
sAppPath*	Application path
fAppPathType*	None [0], Relative [1], Absolute [2], Simload Folder [3], Internet [4], Profile [5], Public [6]
sAppParam*	Optional application parameters
sEventFilePath	Event file w/ timestamps and descriptions, consumable by SxS Player
bEventFile*	[1] creates an event file, [0] does not
sDataFile*	Data file name, including extension
sDataPath*	Data file path
fDataPathType*	None [0], Relative [1], Absolute [2], Simload Folder [3], Internet [4], Profile [5], Public [6]
bDataRwAccessRequired*	[1] copy data file to MyDocuments\temp, fAppPathType = 2, change sDataPath
sWinTitle*	Title of the application window
sWinHandle	Handle of the application window
sProcessID	Application process identifier
sAppControlType*	byTitle, byHandle, byPID
iX*	X position of the application window
iY*	Y position of the application window
iWidth*	Width of the application window (0 is full screen width)
iHeight*	Height of the application window (0 is full screen height)
iTime*	Countdown timer in seconds
iAppLaunchTime	Application launch time in milliseconds

SimLoad Syntax

- SL1-Simload.exe run <seconds>
[<x> <y> [<width> <height>]]
- SL1-Simload.exe start <tempobject>
[<x> <y> [<width> <height>]]
- SL1-Simload.exe stop <tempobject>
- SL1-Simload.exe info
- SL1-Simload.exe help

Side-by-side .ini file



```
SL1-NotepadEdit - Notepad
File Edit Format View Help
[SL1-NotepadEdit]
;AppName=Notepad.exe
;AppPath=c:\Windows\System32\
;fAppPathType=2
;AppParam=
;bEventFile=1
;sDataFile=lordoftherings.txt
;sDataPath=c:\Simloads\Data\Documents\
;fDataPathType=2
;bDataRwAccessRequired=
;swinTitle=
;sAppControlType=byHandle
;iX=0
;iY=0
;iWidth=0
;iHeight=0
;iTime=45

[Settings]
bLogVerbose=1
bDebug=0
iCountdownScreen=2

[Folders]
Data=C:\Simloads\Data\
Results=C:\Simloads\Results\
Simloads=C:\Simloads\Simloads\
Tools=C:\Simloads\Tools\

[Simloads]
SL1-NotepadEdit=C:\Simloads\Simloads\SL1-Notepad\SL1-NotepadEdit.exe

Ln 1, Col 1 | 100% | Windows (CRLF) | UTF-8
```

Workloads

Type 1 SimLoads

Simulated workloads, each focusing on an individual application or a graphics format.

Personas

Type 2 SimLoads

Chained and overlaid simulated workloads, used as personas or "noisy neighbors".




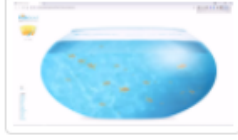
Scores

Type 3 SimLoads

Score workloads measuring predefined system metrics, counters or points obtained.

Type 1 SimLoads - Workloads

[Adobe | Chrome | Geeks3D | Humus | IOPS | MS Edge | MS Office | Notepad | Paint | Media Player | Wordpad]

Thumbnail	Package	SimLoad Name	Load	Description
	SLI-Adobe	SLI-AcrobatReader	Low	Open PDF document in Acrobat Reader and randomly move pages up and down every second
	SLI-Chrome	SLI-ChromeAquariumWebGL	Medium	Open WebGL app Aquarium in Chrome browser
	SLI-Chrome	SLI-ChromeCarVisualizer	Medium	Open Car Visualizer in Chrome browser
	SLI-Chrome	SLI-ChromeFishbowlHTML5	Medium	Open local HTML5 Fishbowl in Chrome browser, and add or remove a fish every half second



Running Tests – “SimLoads”

<https://eucscore.com>



 **Primary User**

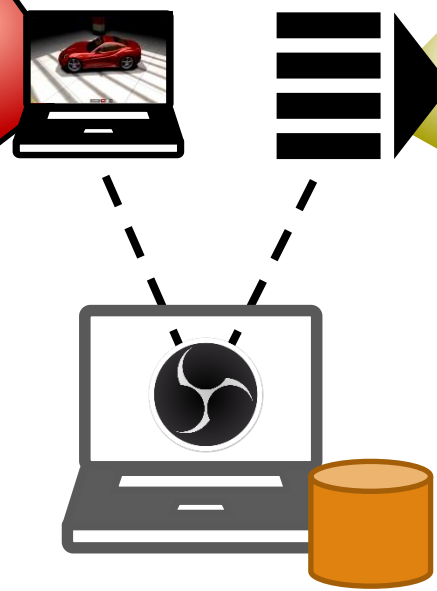
 **Secondary Users**


Primary Simulated Workloads

- SimLoad 1 ----- 45-120 seconds
- SimLoad 2 ----- 45-120 seconds
- SimLoad 3 ----- 45-120 seconds
- SimLoad 4 ----- 45-120 seconds
- SimLoad *n* ----- 45-120 seconds

Persona / Runbook

- Segment 1 ----- 60-600 seconds +
- Segment 2 ----- 60-600 seconds +
- Segment 3 ----- 60-600 seconds +
- Segment 4 ----- 60-600 seconds +
- Segment *n* ----- 60-600 seconds



 **60-90 Minutes**

Type 1 Simloads

Type 2 Simloads

Startup SimLoad

To run a simload after user logon, create a system-wide shortcut to **StartupSimload.exe** in

C:\ProgramData\Microsoft\Windows\Start Menu\Programs\StartUp
(= shell:common startup).

To limit the autostart to only one user, create the shortcut in

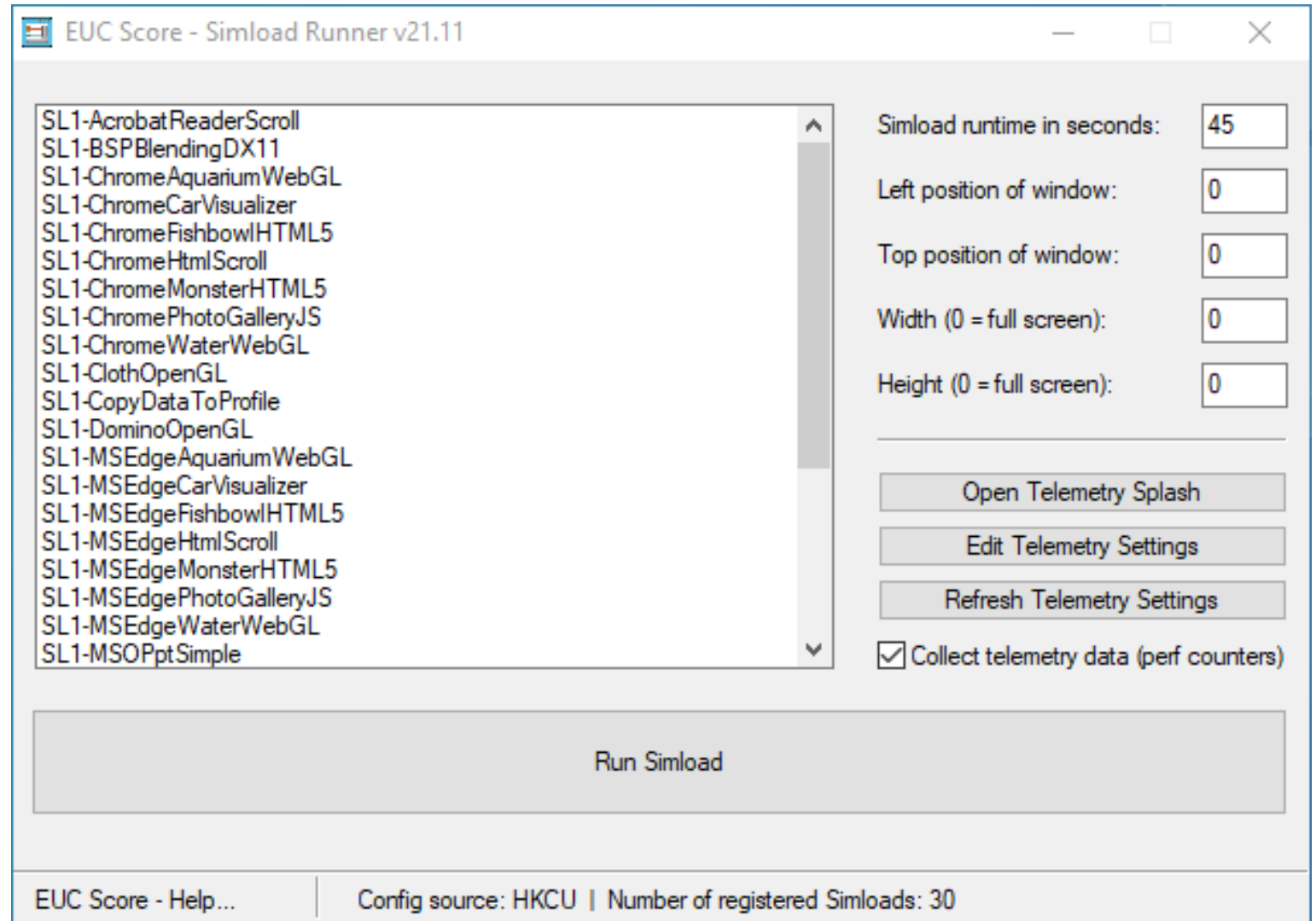
C:\Users\<Username>\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Startup (= shell:startup)

StartupSimload.ini

```
[Startup]
iDelay=30
sSimloadPath=C:\SimLoads\Simloads\SL1-Base\SL1-NotepadEdit.exe
sParameters=run 300
```

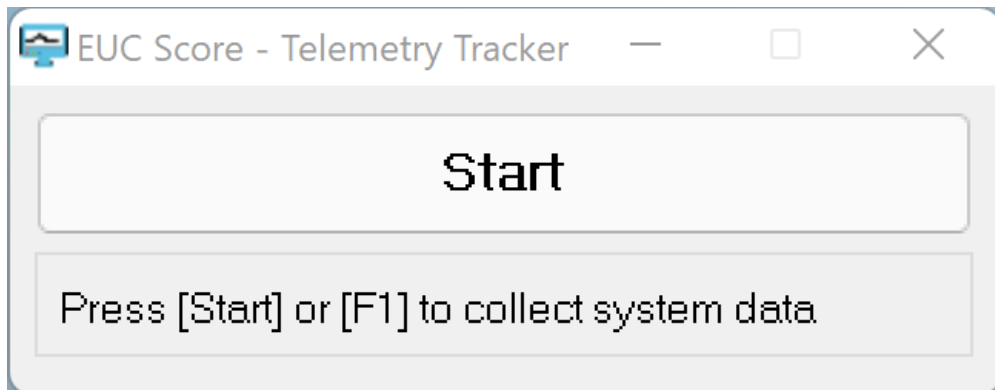
SimLoad Runner

- Run SimLoads
- Set parameters
- Collect telemetry data
(= performance counters)
- Edit telemetry settings



Telemetry Tracker

- Collect performance counters
- Collect process numbers
- Collect application-specific metrics on a trigger



Telemetry.ini

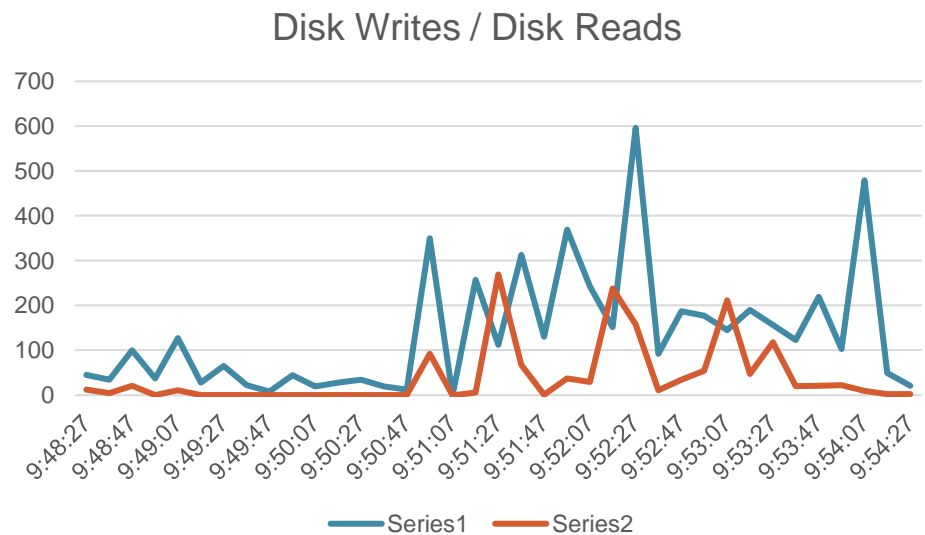
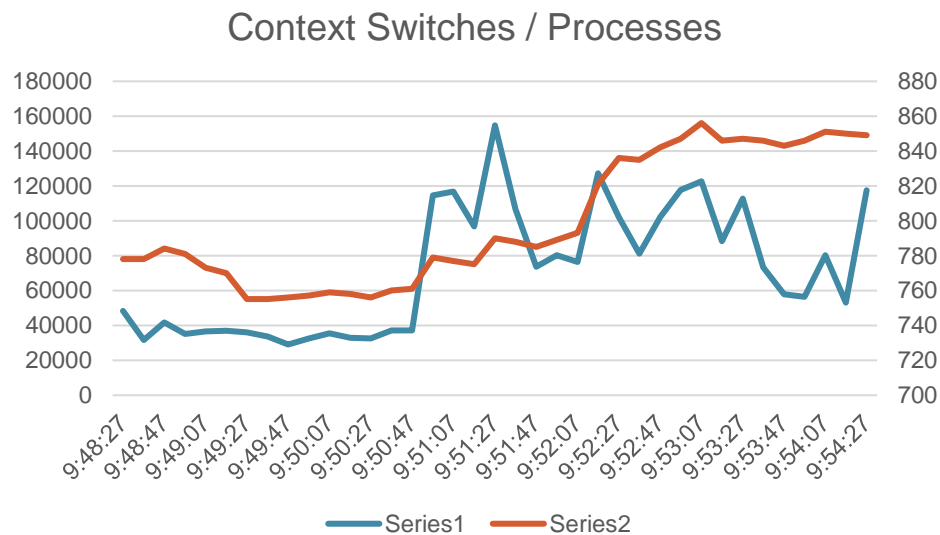
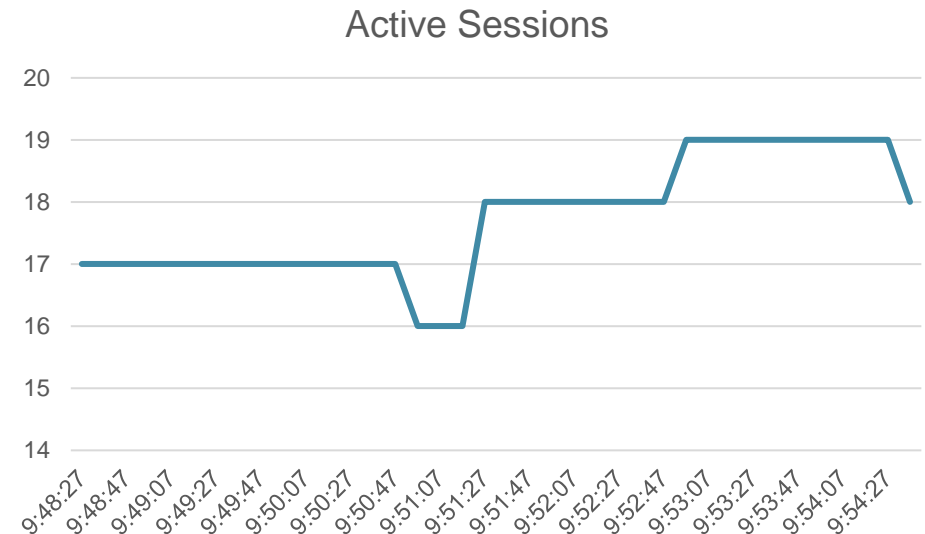
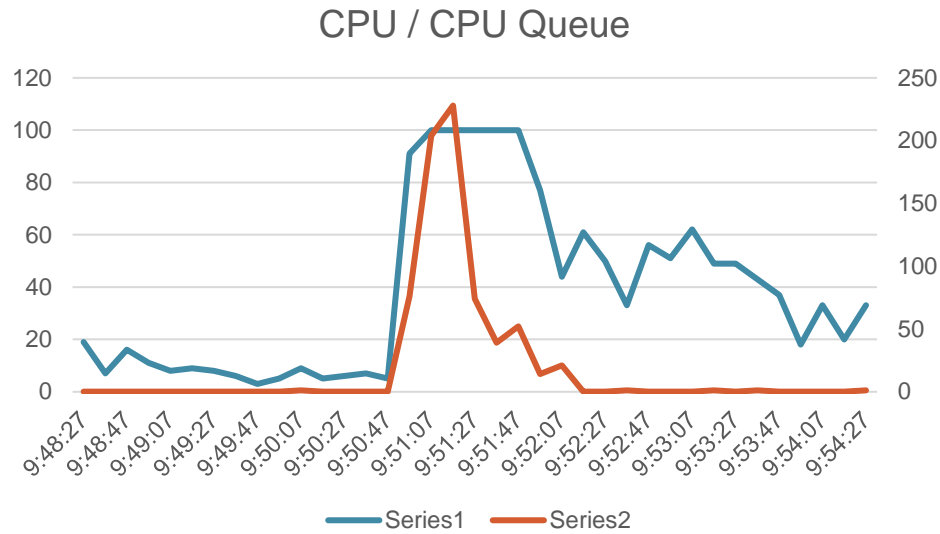
```
[Common]
IntervallInSec=1
MaxCycles=60
AutoRun=1

[PerfCounters]
OutputPath=@ScriptDir
Enabled=1
PerfCounter1=\Processor(_Total)\% Processor Time
NameCounter1=CPU|%
PerfCounter2=\System\Processor Queue Length
NameCounter2=CPU Queue Length

[Processes]
OutputPath=@ScriptDir
Enabled=1
Process1=Explorer.exe
Process2=Notepad.exe
Process3=MsEdge.exe

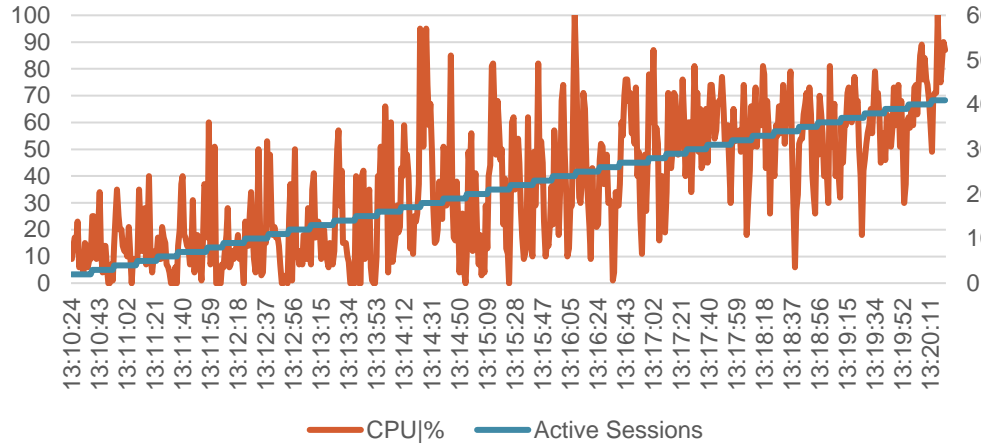
[Trigger]
OutputPath=@ScriptDir
Enabled=1
PerfCounter=1
Threshold=80
SleepCycles=5
```


Telemetry Tracker – Example Data 1

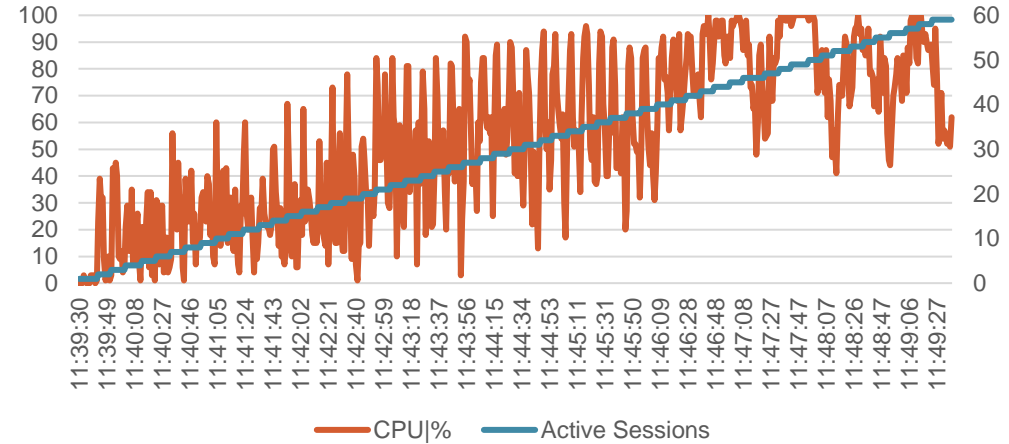


Telemetry Tracker – Example Data 2

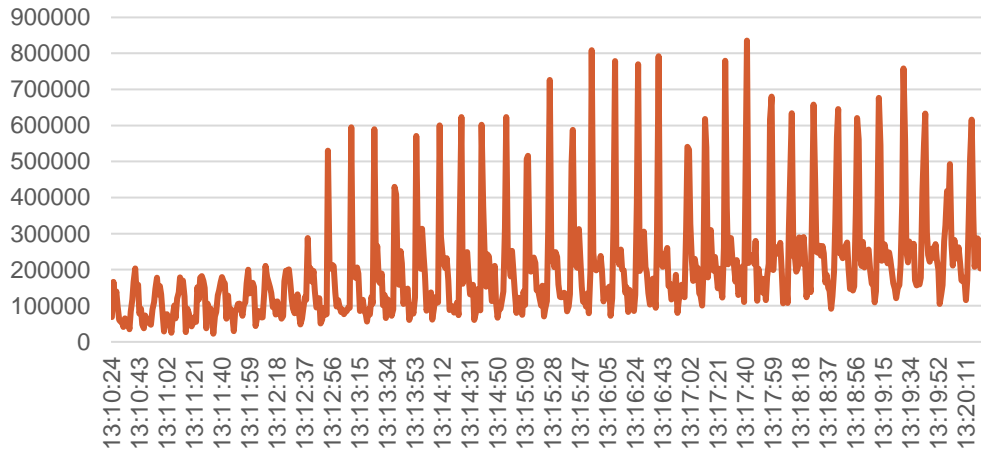
Physical Server 40 NN



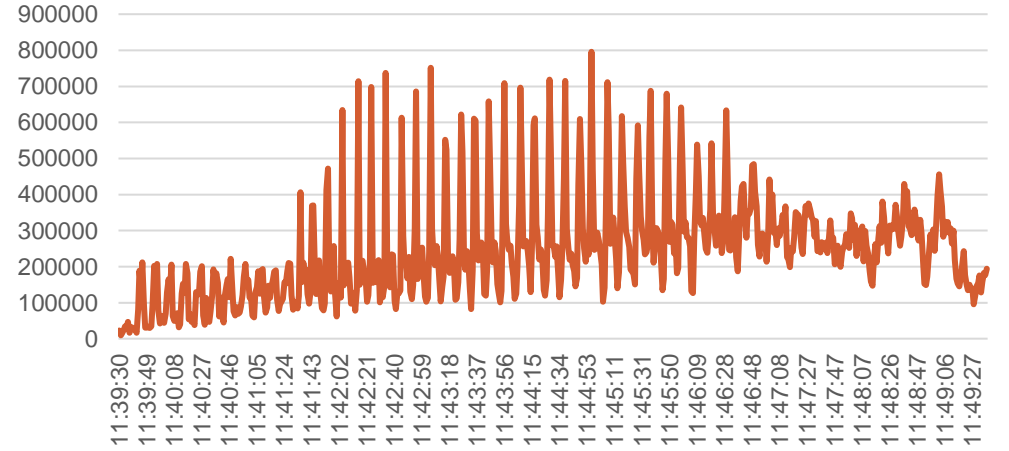
Physical Server 80 NN



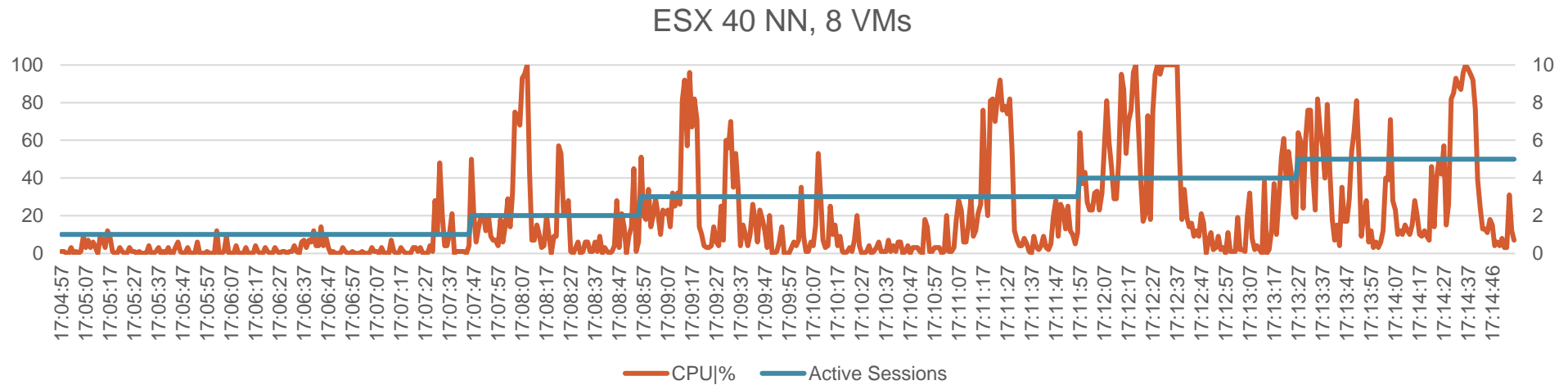
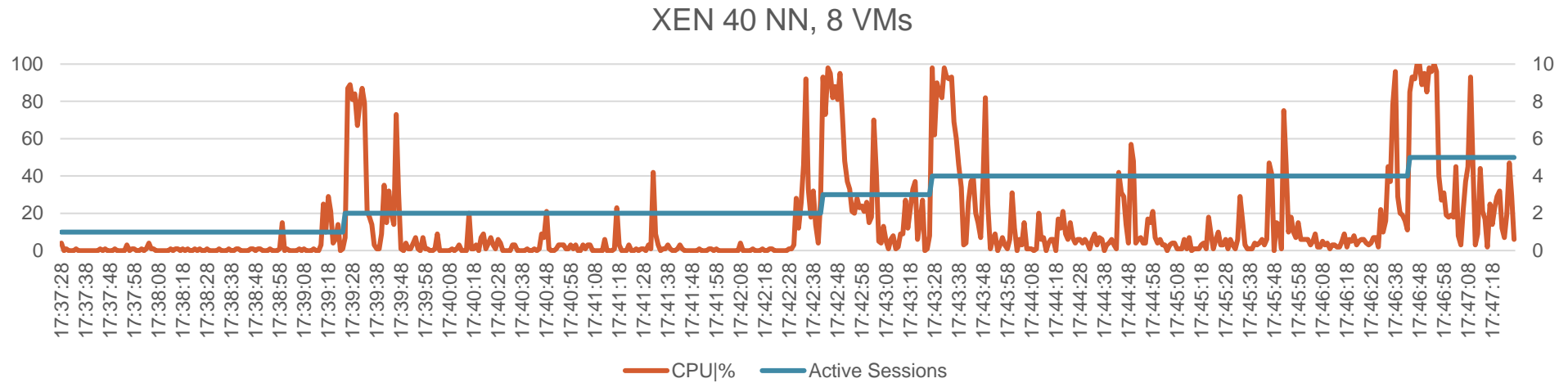
Context Switches



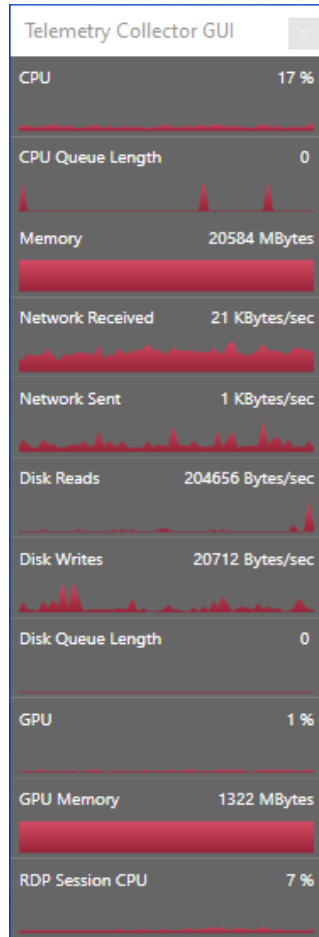
Context Switches



Telemetry Tracker – Example Data 2



Telemetry Collector



```
Windows PowerShell
PS C:\Program Files\TelemetryCollector> .\tccmd.exe --help
TelemetryCollector 4.0.0.0
Copyright c REX Analytics 2020
USAGE:
Run telemetry data capturing with the given counter configuration file for the defined runtime (seconds):
  tccmd --file TelemetryDataConfig.xml --result Telemetry_REX.csv --seconds 3600

-f, --file      Custom XML counter configuration file.
-r, --result    Custom result file.
-s, --seconds   The number of seconds to run.
--help         Display this help screen.
--version      Display version information.

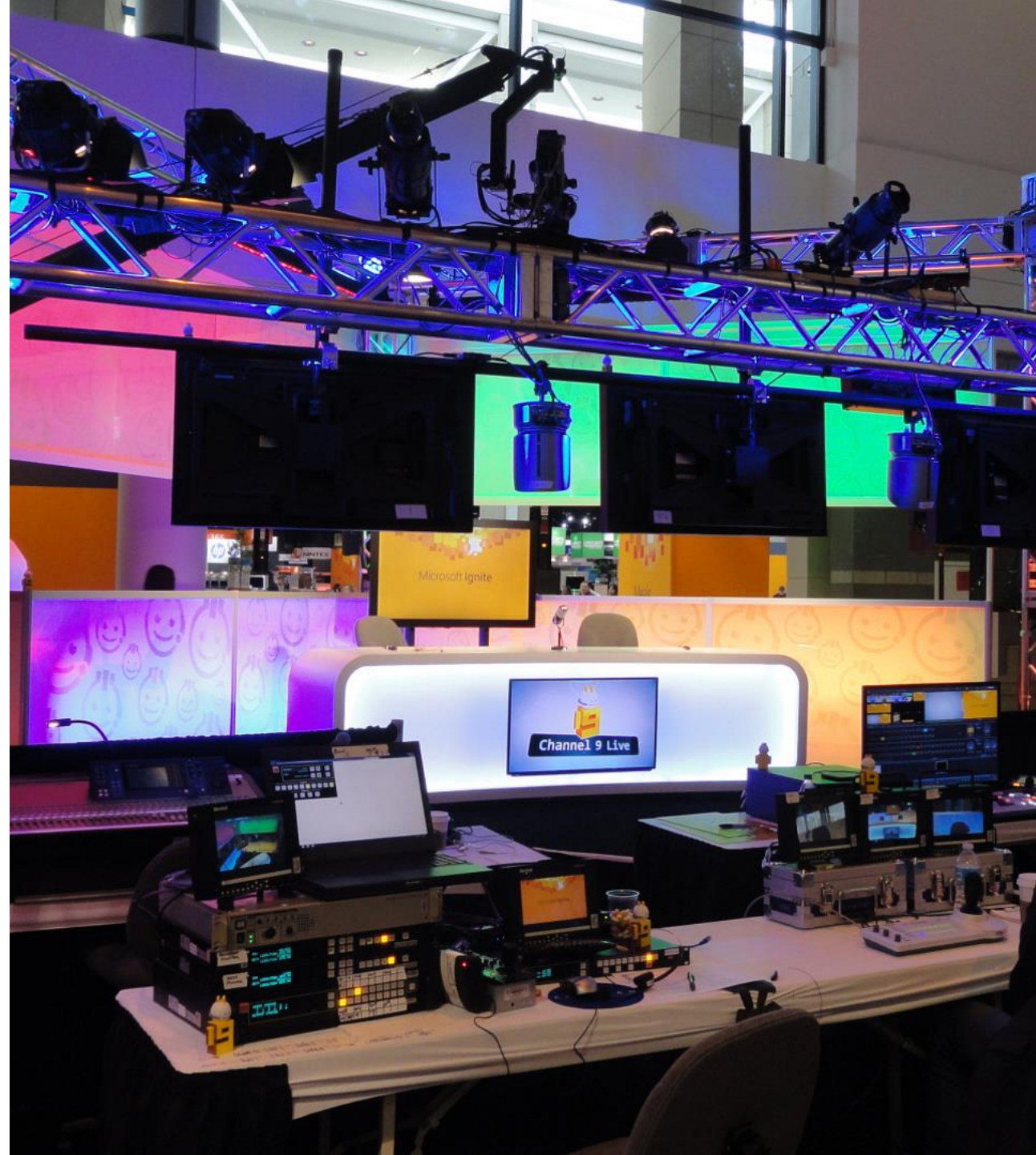
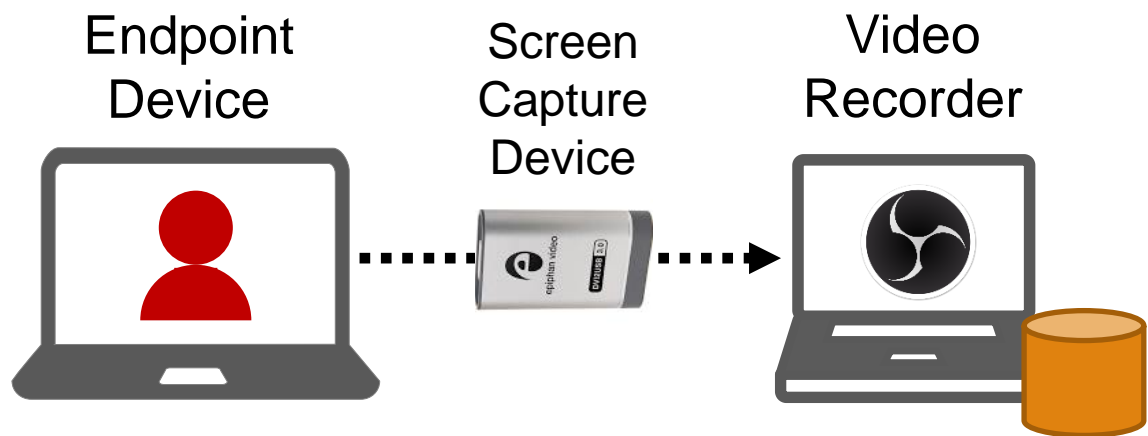
PS C:\Program Files\TelemetryCollector>
```

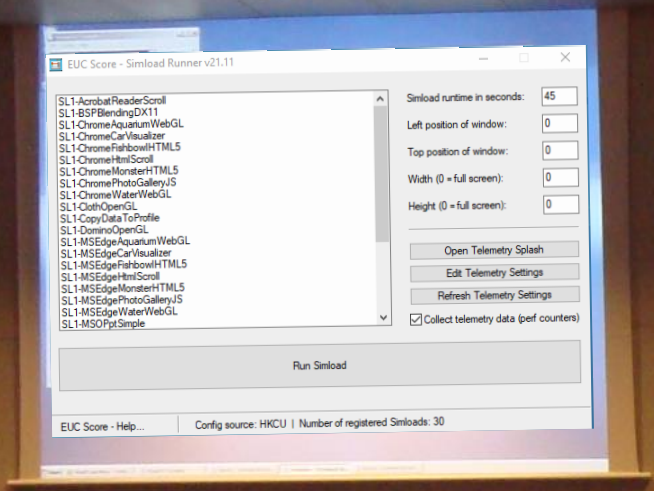
Telemetry_REX.csv - Notepad

TimeStamp	1000, CPU %	CPU Queue Length	Memory MBytes	Network Received KBytes/sec	Network Sent KBytes/sec	Disk Reads Bytes/sec	Disk Writes Bytes/sec	Disk Queue Length	GPU %	GPU Memory MBytes	RDP Session CPU %
2020.10.25 13:08:09.242	0	0	25237	0	0	0	0	0	0	772	0
2020.10.25 13:08:10.267	12.50494	0	25241	1	9	381431.6	0	0	3	772	7.573099
2020.10.25 13:08:11.281	10.10798	0	25240	2	1	389689.7	66978.3	0	3	772	9.676828
2020.10.25 13:08:12.294	10.06606	0	25240	1	7	389290.3	186566.5	0	3	772	9.480039
2020.10.25 13:08:13.304	9.221914	0	25241	0	0	307205.8	145474	0	3	772	8.47321
2020.10.25 13:08:14.318	10.03835	0	25242	3	0	259089.3	0	0	3	772	8.677261
2020.10.25 13:08:15.332	8.712448	0	25241	0	0	257936.4	39290	0	3	772	8.277275
2020.10.25 13:08:16.349	10.63821	0	25243	3	2	386054.6	0	0	3	772	9.963823
2020.10.25 13:08:17.348	12.2051	0	25243	0	0	263153.8	127489.7	0	3	772	11.38643
2020.10.25 13:08:18.349	9.695716	0	25242	2	4	392231.7	0	0	3	772	8.564797
2020.10.25 13:08:19.350	9.823965	0	25242	1	0	261904.6	0	0	3	772	9.759455
2020.10.25 13:08:20.363	9.469488	0	25246	1	0	258690	16167.75	0	3	772	8.286515
2020.10.25 13:08:21.365	10.24942	0	25244	2	0	261496	277845	0	3	772	9.740924
2020.10.25 13:08:22.365	10.56991	0	25244	1	5	262038.2	90077.18	0	3	772	8.786759
2020.10.25 13:08:23.379	11.59265	0	25243	0	0	258949.5	4046.008	0	3	772	10.22341

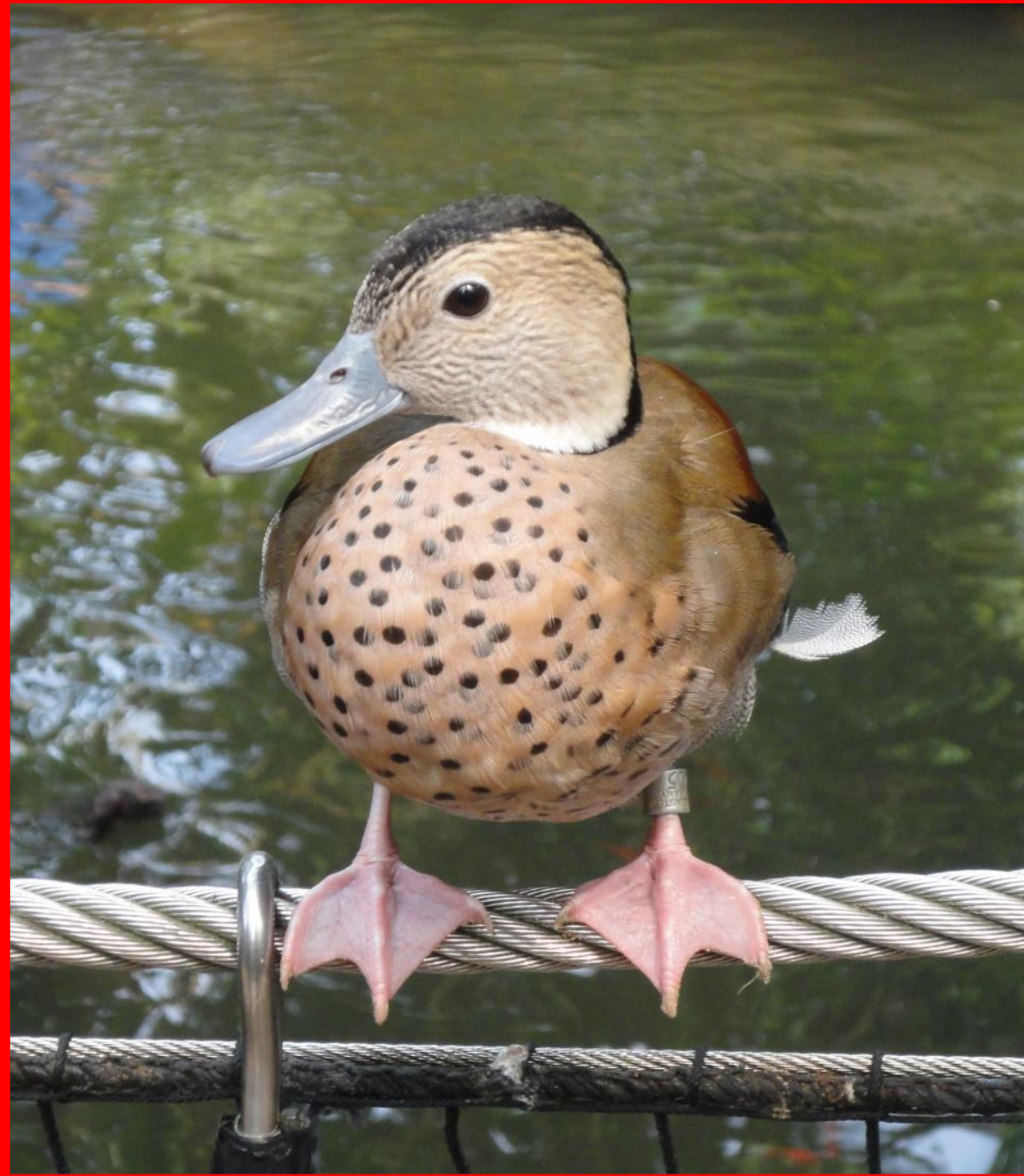
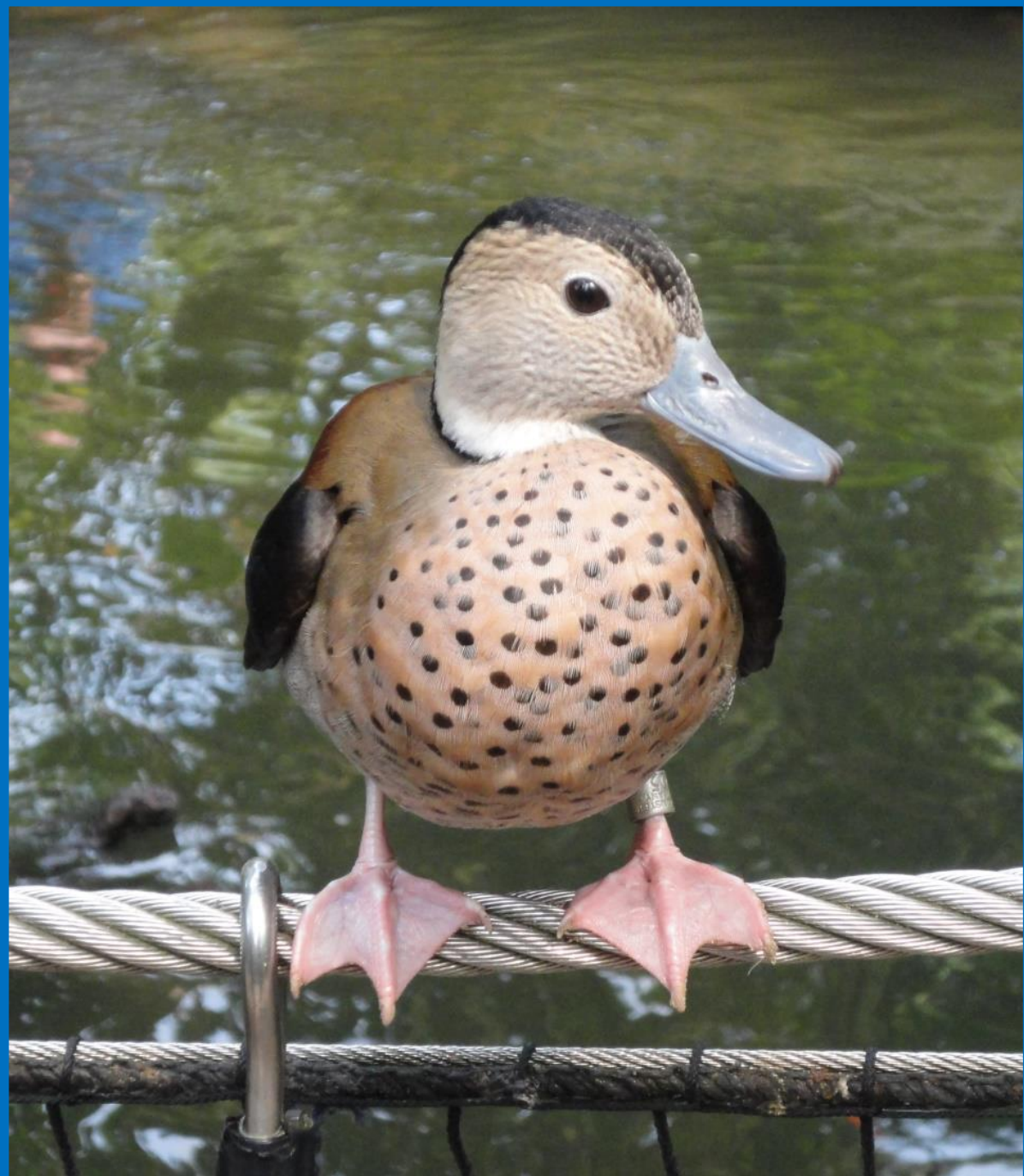
Video Recording

- Screen capture device
- OBS Studio
- Triggered recording



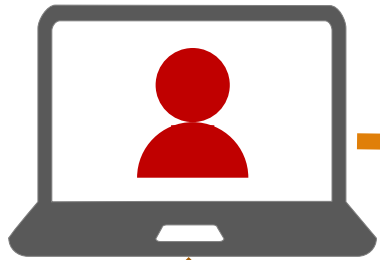


Analyzing Test Runs

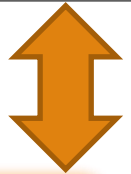


Analyzing Test Results

Primary User Endpoint



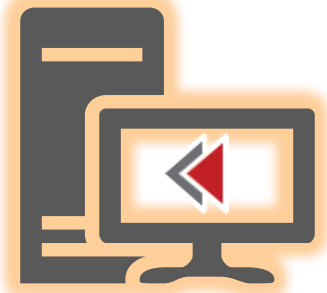
User Experience



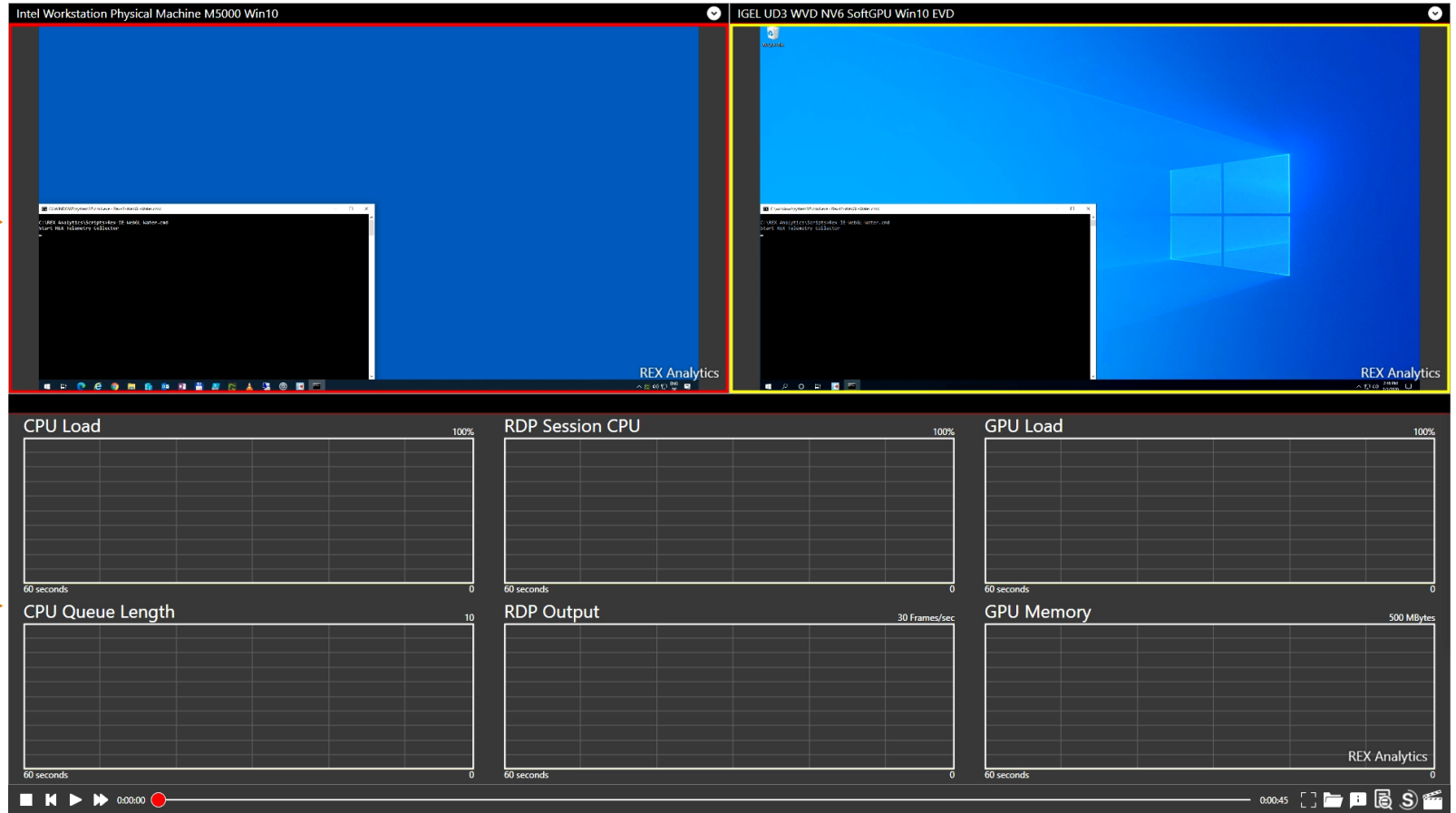
Remoting Protocol



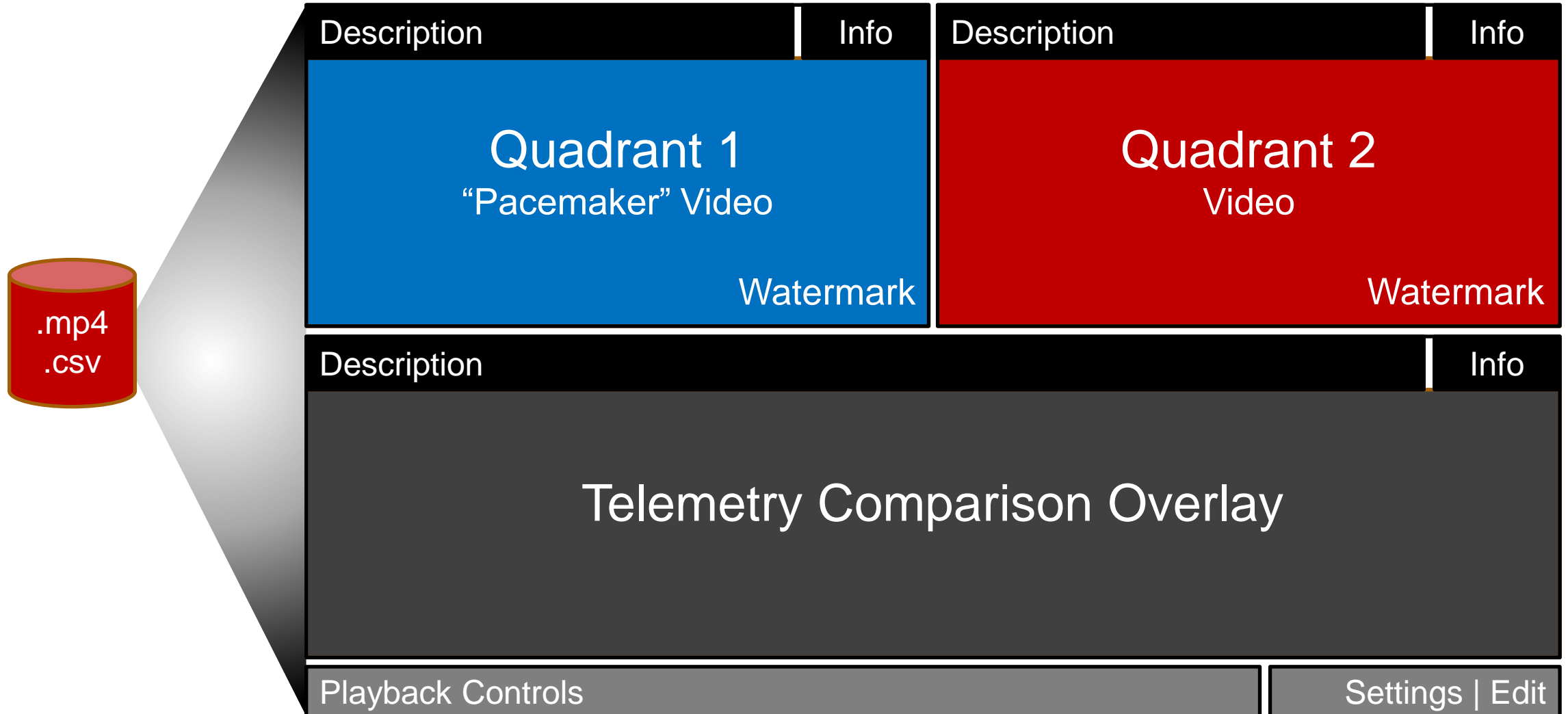
Telemetry Data



Target Session Host



Analyzing Test Results – SxS Media Player





This is almost the end!

What's Next?

- New type 1 and type 2 SimLoads (some may be project-specific)
- Type 3 SimLoads = Score SimLoads
- “Avatar” combining SimLoad Runner and Telemetry Collector features
- A new data analysis and visualization tool based on HTML5
- An SDK for SimLoads

Call to Action

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

info@eucscore.com

NOTE: The EUC Score toolset including the SimLoads is free for community benchmarks, just send me an email...



Thank You

Benny Tritsch | info@drtritsch.com | [@drtritsch](https://twitter.com/drtritsch)
