Login Enterprise powered by NVIDIA nVector

Installation Guide (version 1.0.0)

May 2025

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<u>Revision History:</u>

1.0.0 - May 20, 2025 - Release for GA

Summary

Login VSI, in collaboration with NVIDIA, proposes a unique extension to Login Enterprise that leverages NVIDIA's GPU and virtual GPU (vGPU) performance testing and analysis technology. This integration aims to enhance graphical responsiveness and quality in virtual environments using NVIDIA's nVector agents and performance metrics for scalability testing and VDI production monitoring. This integration enables customers to optimize GPU-based configurations, ensuring optimal performance and cost-efficiency for their solutions.

Getting Started

Pre-requisites

1. A proper functioning VDI Solution based on Citrix, VMware, Omnissa, or Microsoft technologies.
2. A proper functioning Login Enterprise virtual appliance and launcher(s)
3. Admin access to Login Enterprise virtual appliance
4. Knowledge of NVIDIA virtual GPU technology
5. An NVIDIA GPU or vGPU enabled launcher machine
6. Downloaded nVector-agent, and enablement scripts

nVector and Login Enterprise integration

This solution contains a suite of integration scripts that wrap NVIDIA's **nvector-agent.exe** for use with the Login Enterprise platform. These scripts enable you to collect and upload round-trip graphics latency data—measured via NVIDIA nVector's "click-to-pixel-change" mechanism—to the Login Enterprise API as platform metrics. The metrics can then be visualized in the Login Enterprise web interface or retrieved via an API. In addition, the solution also adds NVIDIA suggested, VM-based session metrics for greater visibility into the performance of the system.

Important:
The nvector-agent.exe and its associated components are developed and distributed by **NVIDIA**. Until the nvector-agent.exe is made generally available, you must obtain this executable from NVIDIA and deploy it in your environment. In the future the nvector-agent.exe will be made available by Login VSI.

Downloads

This solution requires four key files to integrate nVector functionality with Login Enterprise. Here is a temporary link to the files you will need - NVIDIA (expires 4/19/25)

1. Extract the files from their respective zip files into a temporary directory. The files you will need for the integration are as follows.
2. **nVector-agent.exe** (version 1.0.0-beta.2)
3. Login Enterprise launcher scripts (client prepare & startup script)
    a. **nVector_Client_Prepare.ps1**
    b. **nVector_Startup_Script.cmd**
    c. More information about these scripts can be found in Appendix A
4. Login Enterprise desktop prepare script (virtual user application)
    a. **nVector_Desktop_Prepare.cs**
    b. More information about this script can be found in Appendix A

Setup & Deployment Steps

Use the following checklist to record your steps

- ☐ Upload nVector agent to virtual appliance
- ☐ Create nVector environment on virtual appliance
- ☐ Create nVector virtual user startup app on virtual appliance
- ☐ Setup launcher with nVector agent
- ☐ Create session metrics and session metrics group
- ☐ Create load test
- ☐ Create continuous test
- ☐ Enable appliance WebUI for nVector platform metrics

Login Enterprise Virtual Appliance setup

Upload nvector-agent.exe to the Login Enterprise Virtual Appliance

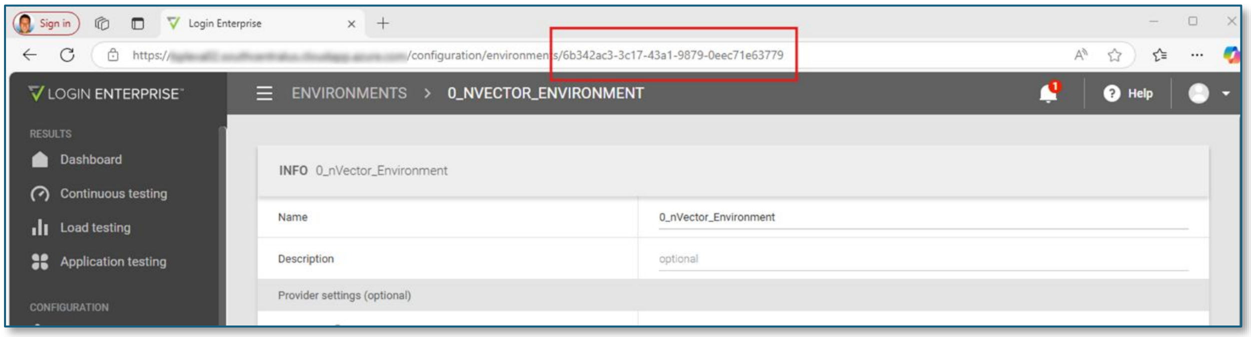
1. Place the `nvector-agent.exe` executable on the Login Enterprise virtual appliance. Use SSH to access the virtual appliance or use SFTP tools like WinSCP if necessary to transfer the file. The location on the virtual appliance Linux filesystem is `loginvsi/content/scriptcontent/nvector-agent.exe`.

Create an environment

1. On the virtual appliance, navigate to "Environments"

2. Click on "Add environment" in the top right corner of the UI

3. Give the environment a name (e.g., nvector environment)
4. Save
5. After clicking Save, select the environment and record the UUID from the page's URL


https://[redacted]/configuration/environments/6b342ac3-3c17-43a1-9879-0eec71e63779

ENVIRONMENTS > 0_NVECTOR_ENVIRONMENT

INFO 0_nVector_Environment

Name	0_nVector_Environment
Description	optional
Provider settings (optional)	

Create the nVector virtual user startup app

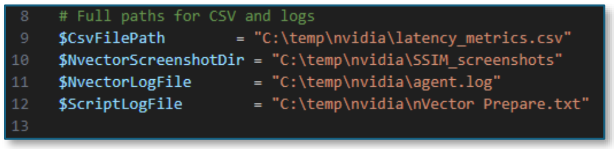
(for help see Importing Applications)

1. Open the downloaded `nVector_Desktop_Prepare.cs` file in a text editor or Visual Studio. Edit the "downloadUrl" variable to match your virtual appliance name. The variable will be towards the top of the file near line 20.
   (e.g., `string downloadUrl = https://myDomain.LoginEnterprise.com/contentDelivery/content/nvidia/nvector-agent.exe`)
2. On the virtual appliance, navigate to "Applications"
3. Click on the green plus sign in the top right corner of the UI to add the application
4. Select "IMPORT APPLICATION"
5. Browse to the "`nvector_Desktop_Prepare.cs`" script you just modified and select "Open"
6. Click "SAVE"

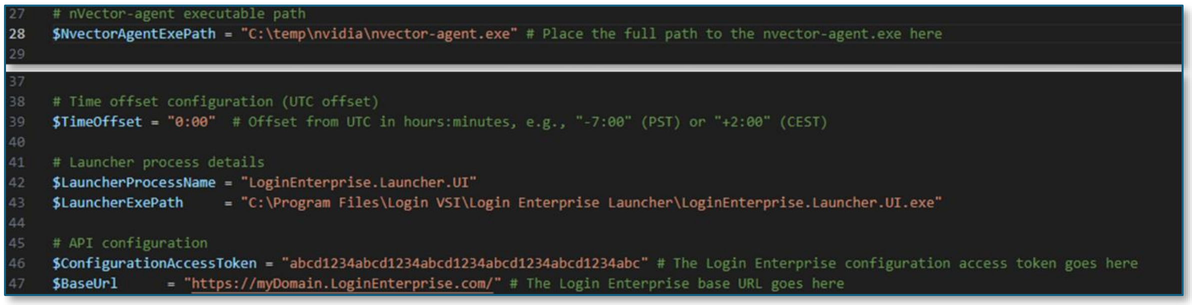
Login Enterprise Launcher Machine(s) setup

1. If you don't have a launcher yet, download installer from the virtual appliance and install launcher software
2. Copy `nVector_Client_Prepare.ps1`, `nVector_Startup_Script.cmd`, and `nvector-agent.exe` file to a directory on the launcher (e.g., `c:\temp\nvidia\`)
3. On the virtual appliance, create a Public API configuration access token and record it for use in the next step
4. Edit the `nVector_Client_Prepare.ps1` file to match the required parameters to your environment (see Key Variables & Parameters). The parameters you are required to set or confirm are: `CsvFilePath`, `NvectorScreenshotDir`, `NvectorLogFile`,

`ScriptLogFile`, `NvectorAgentExePath`, `TimeOffset`, `ConfigurationAccessToken`, `BaseUrl`, and `EnvironmentId`.
Here is an example.



```
# Full paths for CSV and logs
$CsvFilePath          = "C:\temp\nvidia\latency_metrics.csv"
$NvectorScreenshotDir = "C:\temp\nvidia\SSIM_screenshots"
$NvectorLogFile       = "C:\temp\nvidia\agent.log"
$ScriptLogFile        = "C:\temp\nvidia\nVector Prepare.txt"
```



```
# nVector-agent executable path
$NvectorAgentExePath = "C:\temp\nvidia\nvector-agent.exe" # Place the full path to the nvector-agent.exe here

# Time offset configuration (UTC offset)
$TimeOffset = "0:00"  # Offset from UTC in hours:minutes, e.g., "-7:00" (PST) or "+2:00" (CEST)

# Launcher process details
$LauncherProcessName = "LoginEnterprise.Launcher.UI"
$LauncherExePath     = "C:\Program Files\Login VSI\Login Enterprise Launcher\LoginEnterprise.Launcher.UI.exe"

# API configuration
$ConfigurationAccessToken = "abcd1234abcd1234abcd1234abcd1234abcd1234abc" # The Login Enterprise configuration access token goes here
$BaseUrl      = "https://myDomain.LoginEnterprise.com/" # The Login Enterprise base URL goes here
```

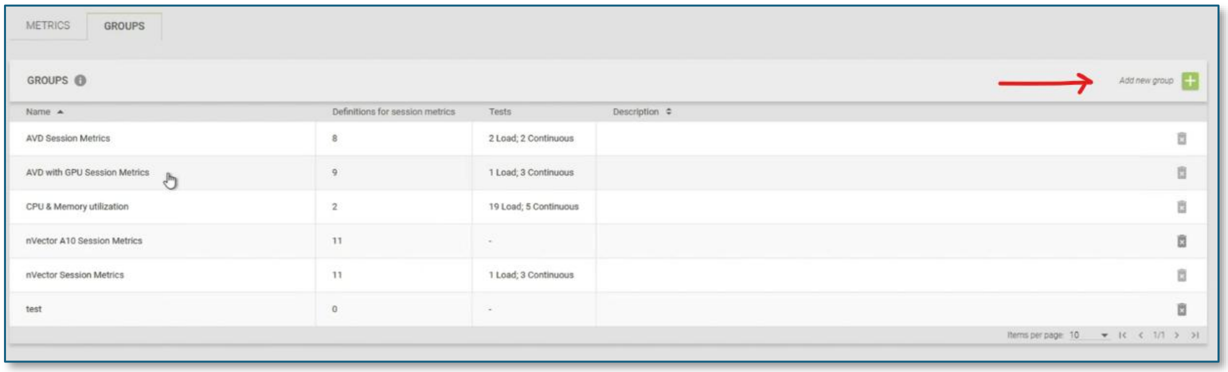
5. Modify the `nVector_Startup_Script.cmd` file to add the full path to the `nVector_Client_Prepare.ps1`
   (e.g., … `-File "c:\temp\nvidia\nVector_Client_Prepare.ps1`")

6. Copy the nVector_Startup_Script.cmd to Windows Startup Folder (e.g., `C:\ProgramData\Microsoft\Windows\Start Menu\Programs\Startup`). This will make sure that when the launcher is restarted, that the nVector agent will automatically start and log new data. For more information on how to start a script on logon see this article for examples of other ways to automatically start a script.

Login Enterprise Session Metrics Configuration

Session metrics allow us to capture performance metrics from the VM being tested. Both PerfMon counters and WMI counters can be added. See this KB article for more information.

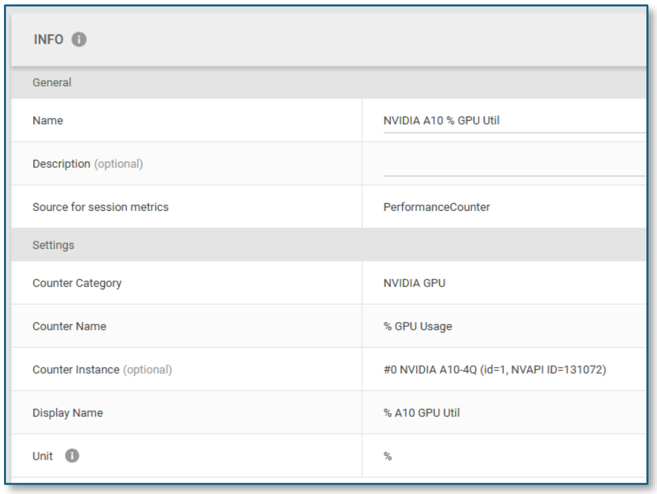
1. Create a new session metrics group for nVector.



Name	Definitions for session metrics	Tests	Description
AVD Session Metrics	8	2 Load; 2 Continuous	
AVD with GPU Session Metrics	9	1 Load; 3 Continuous	
CPU & Memory utilization	2	19 Load; 5 Continuous	
nVector A10 Session Metrics	11	-	
nVector Session Metrics	11	1 Load; 3 Continuous	
test	0	-	

2. Create the session metrics you want to add to the group. For more information on creating session metrics see this Login Enterprise Session Metrics KB article. Create NVIDIA GPU session metrics for GPU Usage, GPU Memory Usage and Frame Buffer Usage. You should

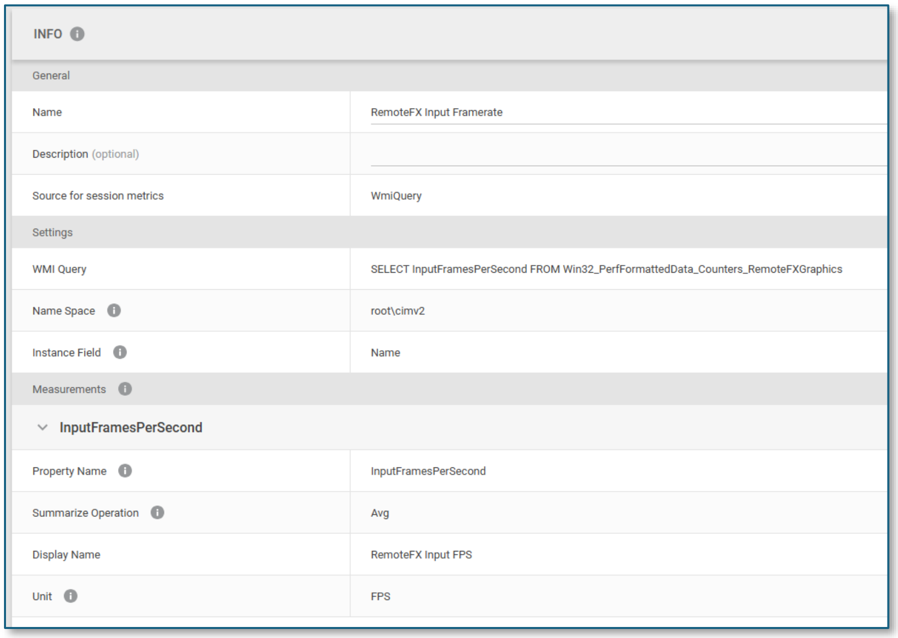
open Perfmon on the target VM to get the information you need. Note that "Counter Category", "Counter Name", and "Counter Instance" must exactly match the values you see in Perfmon. See the example below.



INFO	
General	
Name	NVIDIA A10 % GPU Util
Description (optional)	
Source for session metrics	PerformanceCounter
Settings	
Counter Category	NVIDIA GPU
Counter Name	% GPU Usage
Counter Instance (optional)	#0 NVIDIA A10-4Q (id=1, NVAPI ID=131072)
Display Name	% A10 GPU Util
Unit	%

NOTE: The instance name will change as you change the vGPU profile being used.

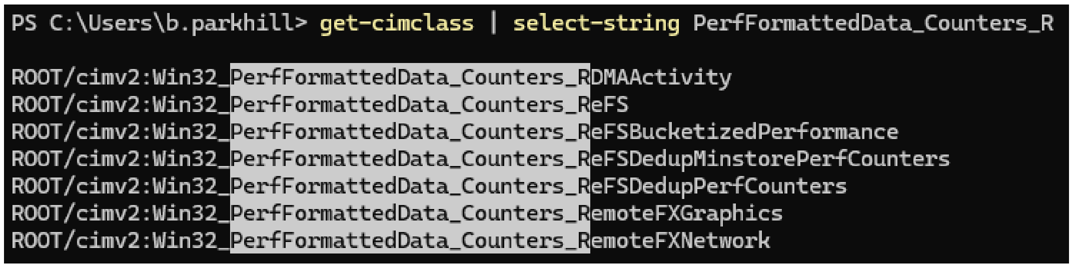
3. Add Protocol Framerate session metrics. Because there can be many instances to collect it is best to use WMI counters. You will want to collect Input and Output Framerate.



INFO	
General	
Name	RemoteFX Input Framerate
Description (optional)	
Source for session metrics	WmiQuery
Settings	
WMI Query	SELECT InputFramesPerSecond FROM Win32_PerfFormattedData_Counters_RemoteFXGraphics
Name Space	root\cimv2
Instance Field	Name
Measurements	
InputFramesPerSecond	
Property Name	InputFramesPerSecond
Summarize Operation	Avg
Display Name	RemoteFX Input FPS
Unit	FPS

   a. To discover WMI counters try the following in PowerShell
      i. To list all counters run: `Get-cimclass | select-string PerfFormattedData`
      ii. Once you find the counter set you'd like to find objects within, run: `Get-CimInstance Win32_PerfFormattedData_`*`NameOfCounterSet`* (e.g., Get-

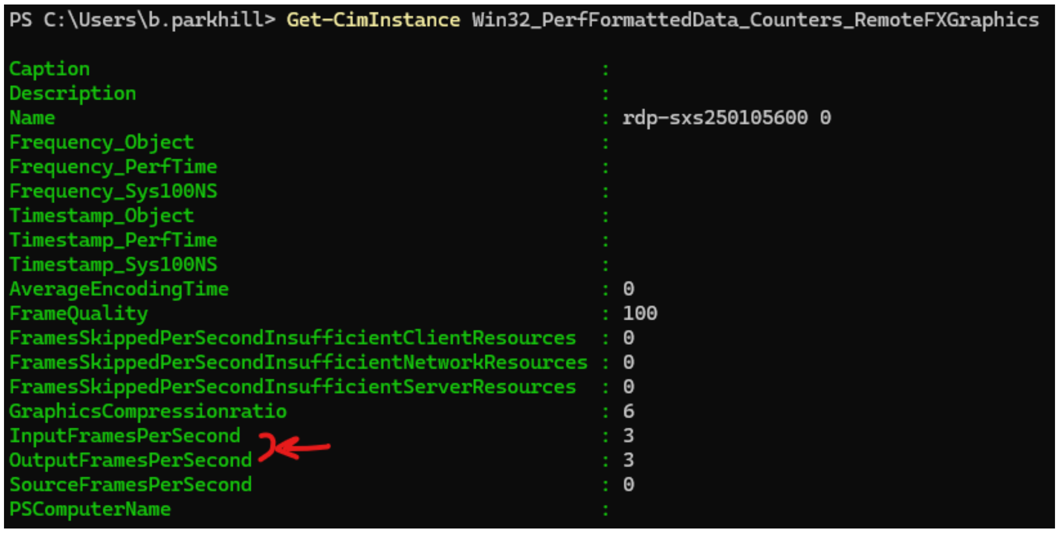
CimInstance Win32_PerfFromattedData_Counters_RemoteFXGraphics)



```
PS C:\Users\b.parkhill> get-cimclass | select-string PerfFormattedData_Counters_R

ROOT/cimv2:Win32_PerfFormattedData_Counters_RDMAActivity
ROOT/cimv2:Win32_PerfFormattedData_Counters_ReFS
ROOT/cimv2:Win32_PerfFormattedData_Counters_ReFSBucketizedPerformance
ROOT/cimv2:Win32_PerfFormattedData_Counters_ReFSDedupMinstorePerfCounters
ROOT/cimv2:Win32_PerfFormattedData_Counters_ReFSDedupPerfCounters
ROOT/cimv2:Win32_PerfFormattedData_Counters_RemoteFXGraphics
ROOT/cimv2:Win32_PerfFormattedData_Counters_RemoteFXNetwork
```

iii. From that result you can find the counters you'd like to use for your session metrics.

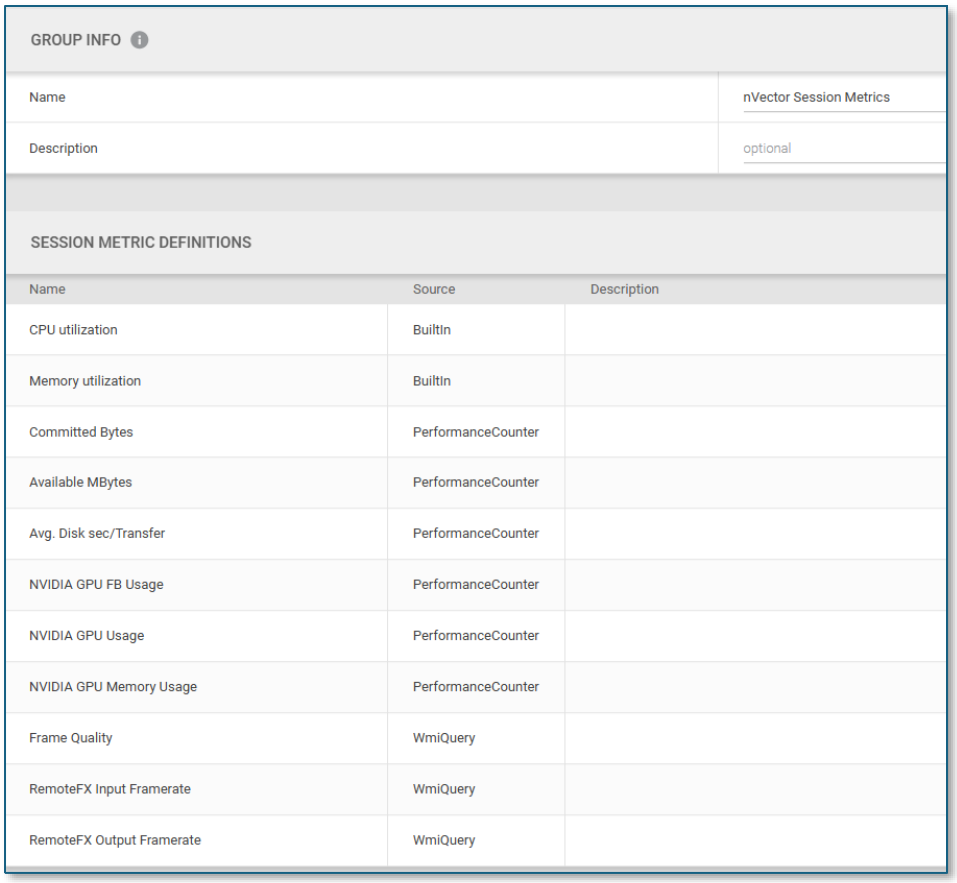


```
PS C:\Users\b.parkhill> Get-CimInstance Win32_PerfFormattedData_Counters_RemoteFXGraphics

Caption                                             :
Description                                         :
Name                                                : rdp-sxs250105600 0
Frequency_Object                                    :
Frequency_PerfTime                                  :
Frequency_Sys100NS                                  :
Timestamp_Object                                    :
Timestamp_PerfTime                                  :
Timestamp_Sys100NS                                  :
AverageEncodingTime                                 : 0
FrameQuality                                        : 100
FramesSkippedPerSecondInsufficientClientResources   : 0
FramesSkippedPerSecondInsufficientNetworkResources  : 0
FramesSkippedPerSecondInsufficientServerResources   : 0
GraphicsCompressionratio                            : 6
InputFramesPerSecond                                : 3
OutputFramesPerSecond                               : 3
SourceFramesPerSecond                               : 0
PSComputerName                                      :
```

4. Add individual session metrics to the nVector Session Metrics Group created above
   a. CPU Utilization
   b. Memory Utilization
   c. GPU Usage
   d. GPU Memory Usage
   e. GPU Framebuffer Usage
   f. Input FPS
   g. Output FPS
   h. Any others you've created and would like to have in this collection

   Here is an example:



GROUP INFO

Name	nVector Session Metrics
Description	optional

SESSION METRIC DEFINITIONS

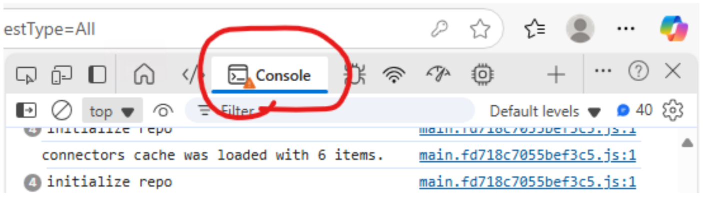
Name	Source	Description
CPU utilization	BuiltIn	
Memory utilization	BuiltIn	
Committed Bytes	PerformanceCounter	
Available MBytes	PerformanceCounter	
Avg. Disk sec/Transfer	PerformanceCounter	
NVIDIA GPU FB Usage	PerformanceCounter	
NVIDIA GPU Usage	PerformanceCounter	
NVIDIA GPU Memory Usage	PerformanceCounter	
Frame Quality	WmiQuery	
RemoteFX Input Framerate	WmiQuery	
RemoteFX Output Framerate	WmiQuery	

Configuring your Login Enterprise Web UI to see Platform metrics when using a Login Enterprise version less than 6.3

As of Login Enterprise version 5.13.6, the virtual appliance is capable of logging 3rd party performance data to a time-series database. To see this data the browser used for the appliance WebUI must have a feature flag enabled.

Feature flag instructions:

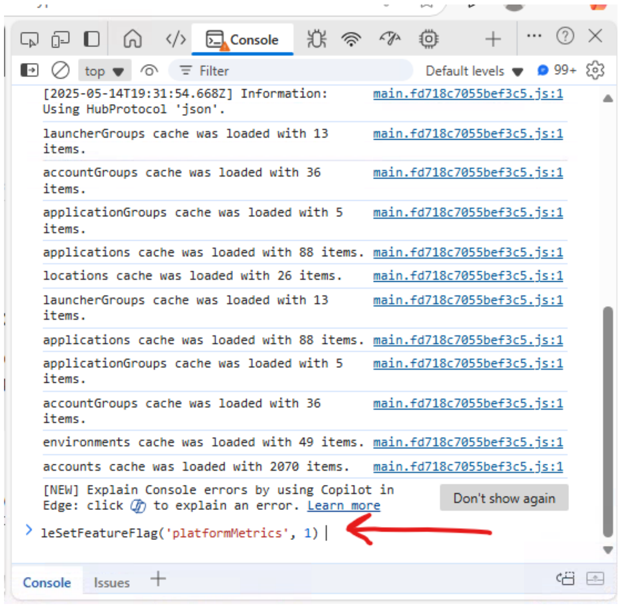
1. Open the browser's developer mode. (e.g., hit F12) and select the "Console" view.



```
initialize repo                                  main.fd718c7055bef3c5.js:1
connectors cache was loaded with 6 items.        main.fd718c7055bef3c5.js:1
initialize repo                                  main.fd718c7055bef3c5.js:1
```

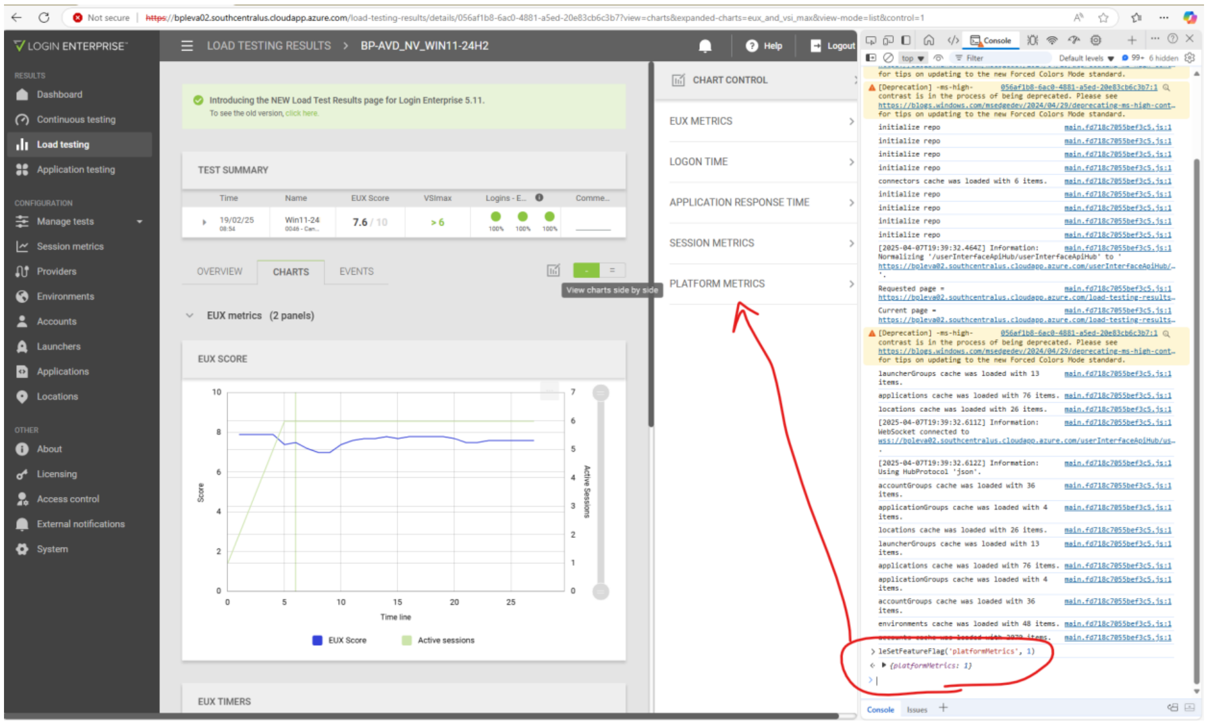
2. Enter the following command at the prompt on the bottom of the page to enable the feature:

```
leSetFeatureFlag('platformMetrics', 1)
```



```
[2025-05-14T19:31:54.668Z] Information:          main.fd718c7055bef3c5.js:1
Using HubProtocol 'json'.
launcherGroups cache was loaded with 13          main.fd718c7055bef3c5.js:1
items.
accountGroups cache was loaded with 36           main.fd718c7055bef3c5.js:1
items.
applicationGroups cache was loaded with 5        main.fd718c7055bef3c5.js:1
items.
applications cache was loaded with 88 items.     main.fd718c7055bef3c5.js:1
locations cache was loaded with 26 items.        main.fd718c7055bef3c5.js:1
launcherGroups cache was loaded with 13          main.fd718c7055bef3c5.js:1
items.
applications cache was loaded with 88 items.     main.fd718c7055bef3c5.js:1
applicationGroups cache was loaded with 5        main.fd718c7055bef3c5.js:1
items.
accountGroups cache was loaded with 36           main.fd718c7055bef3c5.js:1
items.
environments cache was loaded with 49 items.     main.fd718c7055bef3c5.js:1
accounts cache was loaded with 2070 items.       main.fd718c7055bef3c5.js:1
[NEW] Explain Console errors by using Copilot in
Edge: click  to explain an error. Learn more
> leSetFeatureFlag('platformMetrics', 1) |
```

3. Press **Enter** to execute the command. Platform Metrics should now be visible.

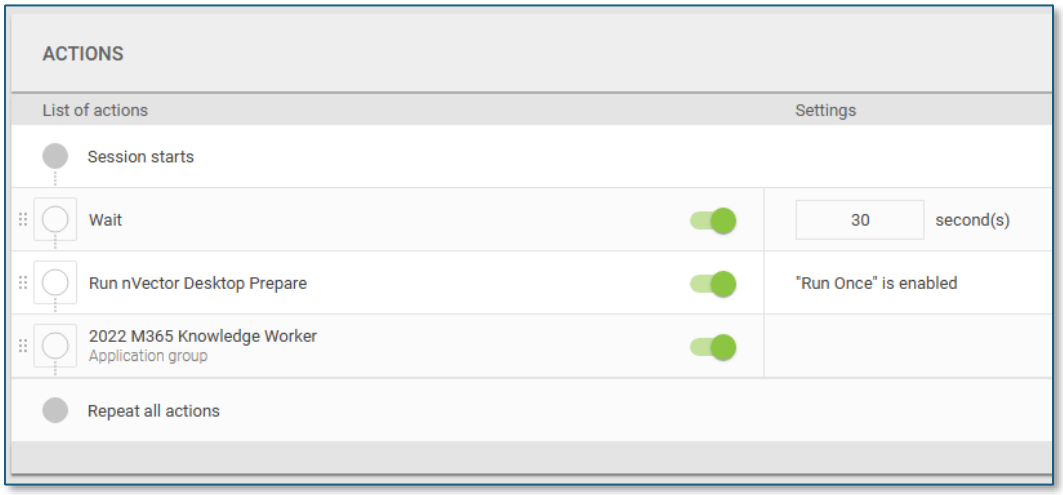


```
[Deprecation] -ms-high-                   056af1b8-6ac0-4881-a5ed-20e83cb6c3b7:1
contrast is in the process of being deprecated. Please see
https://blogs.windows.com/msedgedev/2024/04/29/deprecating-ms-high-cont…
for tips on updating to the new Forced Colors Mode standard.
initialize repo                                  main.fd718c7055bef3c5.js:1
initialize repo                                  main.fd718c7055bef3c5.js:1
initialize repo                                  main.fd718c7055bef3c5.js:1
initialize repo                                  main.fd718c7055bef3c5.js:1
connectors cache was loaded with 6 items.        main.fd718c7055bef3c5.js:1
initialize repo                                  main.fd718c7055bef3c5.js:1
initialize repo                                  main.fd718c7055bef3c5.js:1
initialize repo                                  main.fd718c7055bef3c5.js:1
initialize repo                                  main.fd718c7055bef3c5.js:1
[2025-04-07T19:39:32.464Z] Information:          main.fd718c7055bef3c5.js:1
Normalizing '/userInterfaceApiHub/userInterfaceApiHub' to '
https://bpleva02.southcentralus.cloudapp.azure.com/userInterfaceApiHub/…
'.
Requested page =                                 main.fd718c7055bef3c5.js:1
https://bpleva02.southcentralus.cloudapp.azure.com/load-testing-results…
Current page =                                   main.fd718c7055bef3c5.js:1
https://bpleva02.southcentralus.cloudapp.azure.com/load-testing-results…
[Deprecation] -ms-high-                   056af1b8-6ac0-4881-a5ed-20e83cb6c3b7:1
contrast is in the process of being deprecated. Please see
https://blogs.windows.com/msedgedev/2024/04/29/deprecating-ms-high-cont…
for tips on updating to the new Forced Colors Mode standard.
launcherGroups cache was loaded with 13          main.fd718c7055bef3c5.js:1
items.
applications cache was loaded with 76 items.     main.fd718c7055bef3c5.js:1
locations cache was loaded with 26 items.        main.fd718c7055bef3c5.js:1
[2025-04-07T19:39:32.611Z] Information:          main.fd718c7055bef3c5.js:1
WebSocket connected to
wss://bpleva02.southcentralus.cloudapp.azure.com/userInterfaceApiHub/us…
.
[2025-04-07T19:39:32.612Z] Information:          main.fd718c7055bef3c5.js:1
Using HubProtocol 'json'.
accountGroups cache was loaded with 36           main.fd718c7055bef3c5.js:1
items.
applicationGroups cache was loaded with 4        main.fd718c7055bef3c5.js:1
items.
locations cache was loaded with 26 items.        main.fd718c7055bef3c5.js:1
launcherGroups cache was loaded with 13          main.fd718c7055bef3c5.js:1
items.
applications cache was loaded with 76 items.     main.fd718c7055bef3c5.js:1
applicationGroups cache was loaded with 4        main.fd718c7055bef3c5.js:1
items.
accountGroups cache was loaded with 36           main.fd718c7055bef3c5.js:1
items.
environments cache was loaded with 48 items.     main.fd718c7055bef3c5.js:1
accounts cache was loaded with 2070 items.       main.fd718c7055bef3c5.js:1
> leSetFeatureFlag('platformMetrics', 1)
<- ▶ {platformMetrics: 1}
> |
```

4. Please note that the feature will remain hidden under this flag until further notice.

Testing

1) Create a load test. See this KB article for creating your first load test
    a. In addition to setting up the general load test here are a few extra tasks to add nVector
        i. Make sure the connector is set to "Full Screen" mode
        ii.
        iii. Add the Environment you created in the step above
        iv. Set the session metrics group to the group you created above
        v. In the list of actions add a 30s wait to the beginning of the workload
        vi. After the "Wait" add the nVector_Desktop_Prepare application and set it to "Run Once"

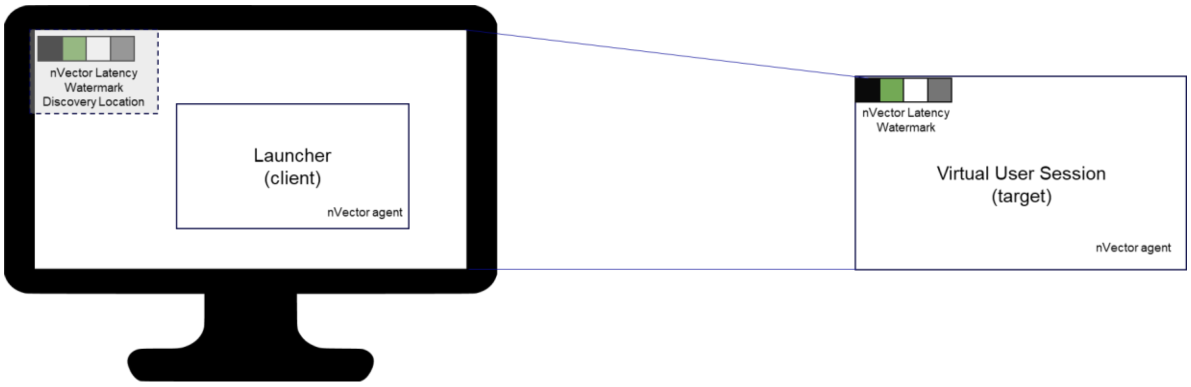


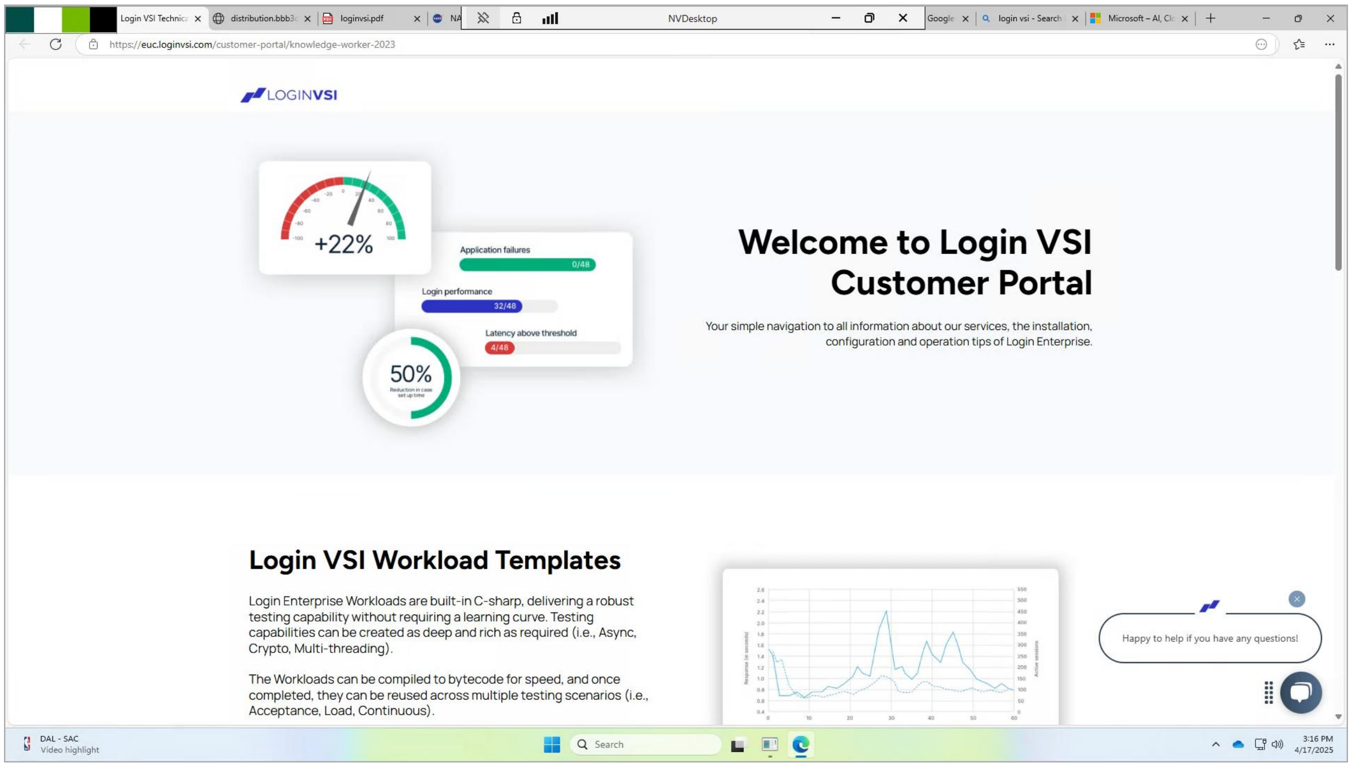
ACTIONS

List of actions	Settings
Session starts	
Wait	30 second(s)
Run nVector Desktop Prepare	"Run Once" is enabled
2022 M365 Knowledge Worker Application group	
Repeat all actions	

        vii. Feel free to add other applications and actions to your workload
2) Create a continuous test. See this Creating a Continuous Test article for creating your first continuous test.
    a. A continuous test can be used to monitor a vGPU enabled VM. Apply the same settings as your load test.
3) Run test
4) To know if the agent is running successfully during the test you should see the nVector watermark on each launcher running the agent. The watermark is a small series of squares

that will frequently change if the launcher agent detects the target agent.


nVector Latency Watermark Discovery Location
Launcher (client)
nVector agent
nVector Latency Watermark
Virtual User Session (target)
nVector agent



Welcome to Login VSI Customer Portal

Your simple navigation to all information about our services, the installation, configuration and operation tips of Login Enterprise.

Login VSI Workload Templates

Login Enterprise Workloads are built-in C-sharp, delivering a robust testing capability without requiring a learning curve. Testing capabilities can be created as deep and rich as required (i.e., Async, Crypto, Multi-threading).

The Workloads can be compiled to bytecode for speed, and once completed, they can be reused across multiple testing scenarios (i.e., Acceptance, Load, Continuous).

Reporting

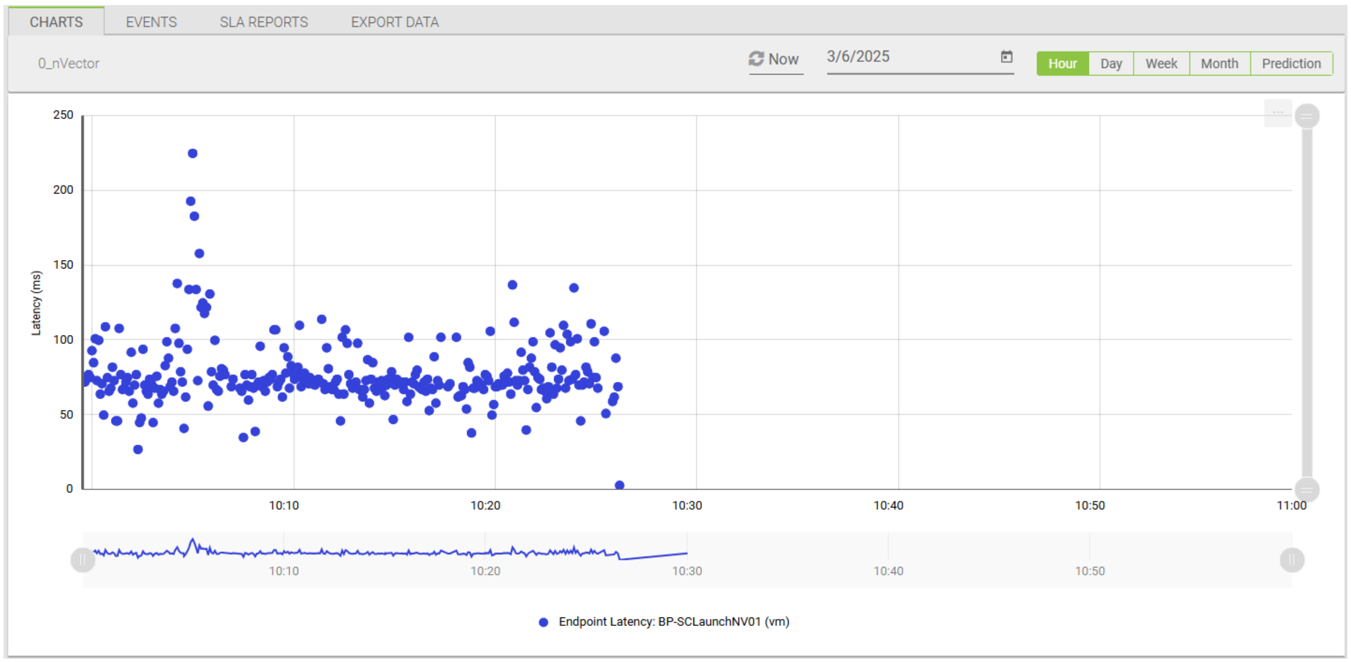
Examples of Latency Results in Continuous Testing Results

Note: you can watch real-time test results of a load test using a continuous test view if they both use the same “environment” ID in their test configuration settings.

Hourly View

Screenshot

The following example graph visualizes nVector latency measurements over an hourly timeframe in the Login Enterprise web interface. (depending on LE version, you may have to turn on Platform Metrics with a feature flag in the browser)



Explanation of Graph Elements:

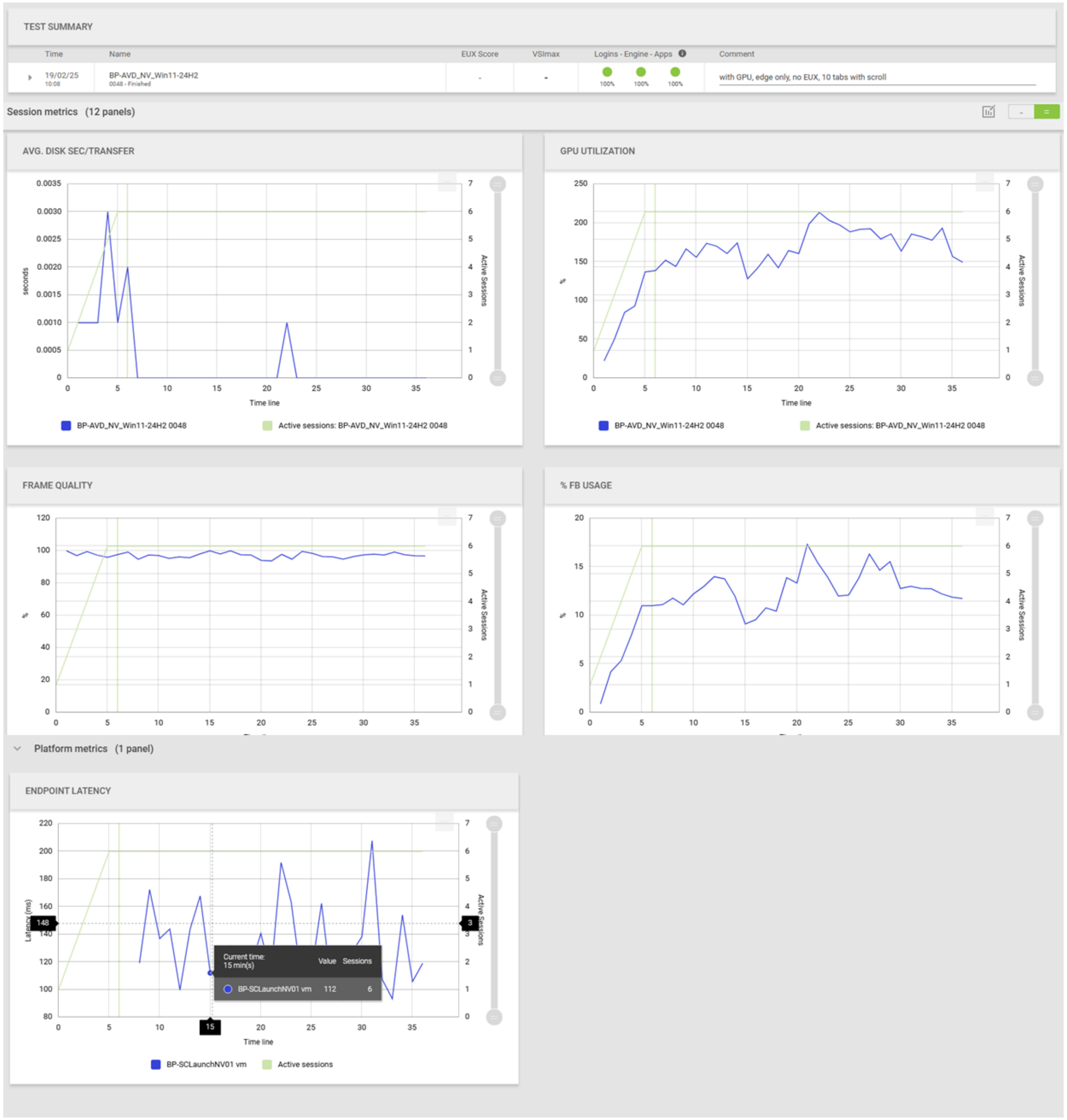
- **Y-Axis (Latency in ms)** → Each **datapoint** represents a **latency measurement in milliseconds**.
- **X-Axis (Time in Hourly Span)** → Represents the **time range** for **nVector latency measurements**.
- **"Latency (ms)"** → This corresponds with the **unit key** in the API datapoint.
- **"Endpoint Latency"** → This corresponds with the **displayName key** in the API datapoint.
- **Hostname (e.g., BP-SCLaunchNV01)** → This corresponds with the **instance key** in the API datapoint.

- **"vm" (Component Type)** → This corresponds with the **componentType key** in the API datapoint.

These labels align **directly with the API response structure** and are displayed in the **Login Enterprise web interface graphs**.

Examples of Latency Results in Load Testing Results

To see load test results you must wait for the load test to complete. You can compare load tests. You can create a PDF report of the results as well.



TEST SUMMARY

Time	Name	EUX Score	VSImax	Logins - Engine - Apps	Comment
19/02/25 10:08	BP-AVD_NV_Win11-24H2 0048 - Finished	-	-	● 100% ● 100% ● 100%	with GPU, edge only, no EUX, 10 tabs with scroll

Session metrics (12 panels)

Best Practices

1) Best practices
    a. It is recommended to use only one session per launcher. If you would like to run a large load test and only have a limited number of launchers please contact support and we can help you with that.
    b. Always run sessions in full screen on the launcher
2) You can use an Application test in Login Enterprise with a Desktop connector to make sure the virtual user successfully downloads and runs nvector-agent.

Appendix A – Script Overview

nVector_Client_Prepare.ps1 (for Login Enterprise Launcher machine)

Purpose

- Ensures the **Login Enterprise Launcher** process is running and starts it if it's not already active.
- Invokes nvector-agent.exe with the **client role** to measure round-trip latency.
- Terminates any running instances of nvector-agent.exe before restarting it with user-defined parameters.
- Monitors a CSV file for new latency results and uploads them to the Login Enterprise API as **Platform Metrics**.

Key Variables & Parameters

Required settings

- **CsvFilePath -** Path to the CSV file where the nvector-agent writes latency metrics.
- **NvectorScreenshotDir -** Directory for screenshots (if required by nVector).
- **NvectorLogFile -** Log file path for the nvector-agent.
- **ScriptLogFile -** Path for logs produced by this PowerShell script.
- **NvectorAgentExePath -** Full path to the nvector-agent.exe on the Login Enterprise Launcher.
- **TimeOffset -** Optional offset from UTC (e.g., "0:00", "-7:00", "+2:00").
- **ConfigurationAccessToken -** Login Enterprise API token with **Configuration** access level.
- **BaseUrl -** Base URL of the Login Enterprise instance. (e.g., https://myDomain.LoginEnterprise.com/)
- **EnvironmentId -** Unique environment identifier in Login Enterprise (obtained from your appliance).

Optional settings

- **NvectorAgentCheckIntervalMs -** How often (in milliseconds) the nvector-agent checks latency.
- **PollingInterval -** How frequently (in seconds) this script checks the CSV for new entries.
- **MaxLatencyThreshold -** Maximum allowed latency (in ms) before a reading is discarded as spurious.
- **ApiEndpoint -** Endpoint for posting the latency metrics (default: publicApi/v7-preview/platform-metrics).

Usage Example

1. **Edit the Script Variables:**
   At the top of nVector_Client_Prepare.ps1, set paths, thresholds, time offsets, and API configuration details to match your environment.

2. **Invoke the Script:**
    - Manually via PowerShell:

```
.\nVector_Client_Prepare.ps1
```

    - Or automatically through nVector_Startup_Script.cmd or a scheduled task.

3. **Verification:**
    - Check the PowerShell console or the ScriptLogFile to confirm that:
        - The **Login Enterprise Launcher** process is running.
        - The **nvector-agent.exe** was started in **client mode**.
        - New lines in the CSV are being uploaded to the **Login Enterprise API**.

nVector_Startup_Script.cmd (for Login Enterprise Launcher)

Purpose

- A simple **Windows CMD script** that invokes nVector_Client_Prepare.ps1 on the **Login Enterprise Launcher**.
- Ensures that the **client script** runs automatically at user login without requiring manual execution.
- Can be placed in the **Windows Startup folder** or configured as a **scheduled task**.

Key Variables and Parameters

- **File Path to PowerShell Script -** Update the CMD file with the correct path to nVector_Client_Prepare.ps1 to match its location on the **Login Enterprise Launcher**.

Usage Example

To automatically start nVector_Client_Prepare.ps1 at user login, create the following **CMD script**:

```
powershell.exe -ExecutionPolicy Bypass -File "C:\Path\To\nVector_Client_Prepare.ps1"
```

- Save the CMD file and place it in the Windows Startup folder:
  C:\ProgramData\Microsoft\Windows\Start Menu\Programs\Startup

Automatic Invocation:

- When a user logs in, the CMD file runs and starts the **client integration** automatically.
- Alternatively, configure it as a **Windows Task Scheduler job** for more control over execution timing.

nVector_Desktop_Prepare (C# Workload)

Purpose

- Runs on the **Target/Desktop** machine in Login Enterprise, often configured as a **workload**.
- Ensures the **nvector-agent.exe** is available by downloading it from the Login Enterprise virtual appliance if necessary.
- Starts nvector-agent.exe with the **desktop role** (-r desktop) to generate a watermark for latency measurement.
- The **client role** nvector-agent.exe running on the Login Enterprise Launcher detects these watermarks to calculate round-trip latency.

Key Variables & Parameters

- **tempDir**
  Location (commonly %TEMP%) where the agent will be temporarily stored.
- **logFilePath**
  Path for the desktop agent's log file.

Usage Example

1. **Upload the Workload:**
   - Use the **Login Enterprise web interface** to upload nVector_Desktop_Prepare.cs as a **custom workload**.
   - Configure the workload settings (e.g., set to **Run Once** if applicable).
2. **Adjust Variables as Needed:**
   - Change logFilePath if needed to specify a different location for the log output.
3. **Run the Workload:**
   - When executed, the workload downloads and runs nvector-agent.exe in **desktop mode** (-r desktop).
   - The **client role** nvector-agent.exe on the Login Enterprise Launcher will detect the watermark changes and use them to compute round-trip latency.

get_nVectorMetrics.ps1

Purpose

- Retrieves raw **Platform Metrics data** (including **nVector latency**) from the **Login Enterprise API**.
- Queries the **v7-preview/platform-metrics** API endpoint.
- Allows users to **export latency data** for further analysis in **CSV or JSON format**.
- Can be used to **validate latency measurements** retrieved from the **nVector client script**.

Key Parameters

In **get_nVectorMetrics.ps1**, modify default **output file paths and API parameters** if necessary.

- **StartTime, EndTime (Mandatory)**
    - Defines the time range for retrieving metrics.
    - Must be in **ISO 8601 Zulu format** (e.g., "2025-02-07T00:00:00.000Z").
- **EnvironmentId (Mandatory)**
    - Unique identifier for the **Login Enterprise environment**.
    - Filters metrics to only include data from the specified environment.
- **ApiAccessToken (Optional)**
    - Overrides the default **Login Enterprise API token**.
- **BaseUrl (Optional)**
    - Overrides the default **Login Enterprise API Base URL**.
- **OutputCsvFilePath, OutputJsonFilePath (Optional)**
    - Defines where the retrieved metrics will be saved.
    - If omitted, defaults to:
        - CSV: C:\temp\get_nVectorMetrics.csv
        - JSON: C:\temp\get_nVectorMetrics.json
- **LogFilePath (Optional)**
    - Specifies a log file to store script execution details.
    - Default: C:\temp\get_nVectorMetrics_Log.txt

Usage Example

To retrieve **nVector latency metrics** from the **Login Enterprise API**, run the following command:

```
.\get_nVectorMetrics.ps1 -StartTime "2025-02-07T00:00:00.000Z" -EndTime "2025-02-07T23:59:59.999Z" -EnvironmentId "abcdef1234" -ApiAccessToken "MY_TOKEN" -BaseUrl "https://mydomain.LoginEnterprise.com" -OutputCsvFilePath "C:\temp\nVector.csv" -OutputJsonFilePath "C:\temp\nVector.json" -LogFilePath "C:\temp\MetricsLog.txt"
```

Expected Behavior:

- Retrieves **Platform Metrics data** for the specified time range.
- Saves results as:
    - **JSON file** (OutputJsonFilePath)
    - **CSV file** (OutputCsvFilePath)
- Logs execution details in **LogFilePath**.

Additional Information

Documentation Links

- Login Enterprise Application Upload
- Login Enterprise Script Editor