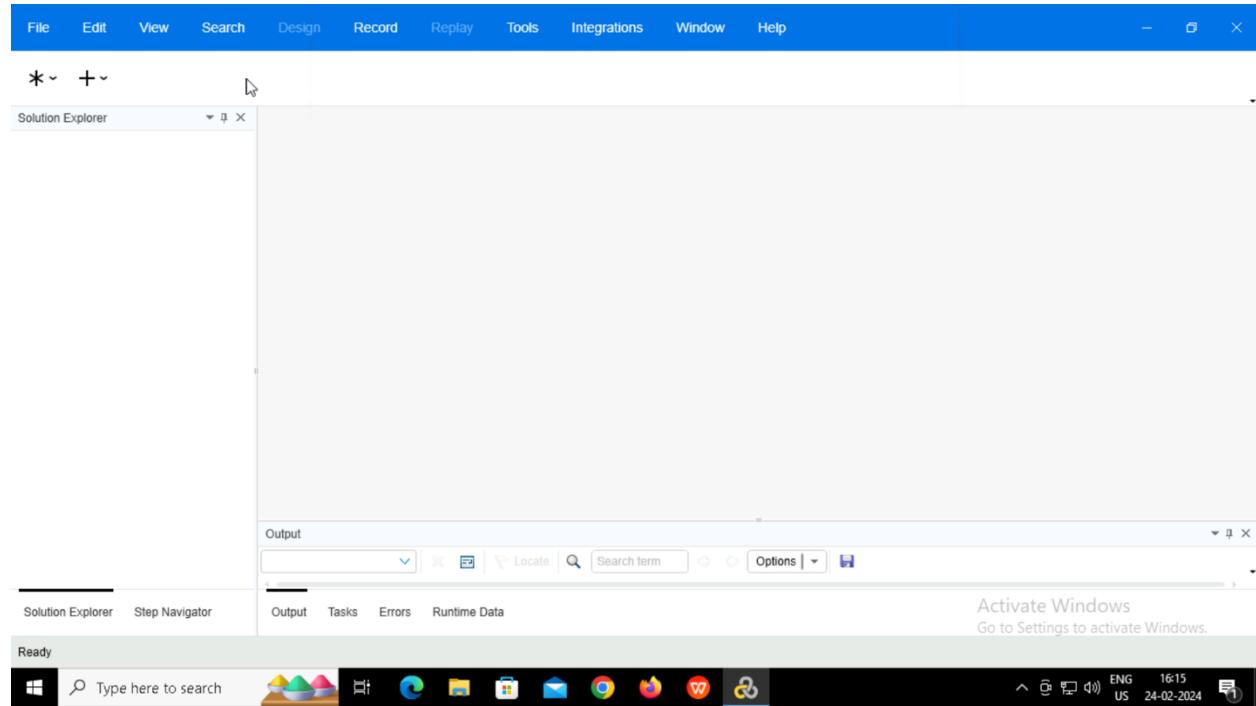


Performance Testing, Monitoring and Analysis with LoadRunner For Orangehrm website

Designing Loadrunner to simulate realistic user scenarios, including loading the site, login in the user and logging out the user.

Opening Load runner Vugen



Creating Scripts in LoadRunner Vugen

The screenshot shows the LoadRunner Vugen interface. In the top menu bar, the 'File' tab is selected. Below the menu, there's a toolbar with icons for File, Edit, View, Search, Design, Record, Replay, Tools, Integrations, Window, and Help. A 'Solution Explorer' window is open on the left, showing a tree structure with 'Solution Orange_sln' expanded, containing 'Orangehrm_script [Web - HTTP/HTML]' which has 'Actions' expanded, showing 'vuser_init', 'Action' (selected), and 'vuser_end'. The main workspace is titled 'Create a New Script'. It has sections for 'Category' (VuGen, Single Protocol, Multiple Protocols, Mobile and IoT, Popular, Recent), 'Protocol' (RTE, SAP, SAP GUI, Siebel, SMP, SMTP, Web Services, Windows Sockets), and 'Filter'. Below these are fields for 'Script Name' (Orngehrm_script), 'Location' (D:\Orngehrm_Mod5), 'Solution Name' (Orange_sln) with a checked checkbox for 'Create folder for solution', and 'Solution Target' (D:\Orngehrm_Mod5\Orange_sln\Orange_sln.ltsn). At the bottom right of the workspace are 'Create' and 'Cancel' buttons. The status bar at the bottom shows 'Ready', a search bar, and system information like 'ENG US 16:16 24-02-2024'.

Create a New Script

Category: VuGen

Protocol:

- RTE (Remote Terminal Emulator)
- TruClient - Mobile Web
- SAP - Web
- TruClient - Native Mobile
- SAP GUI
- TruClient - Web
- Siebel - Web
- Tuxedo
- SMP (SAP Mobile Platform)
- Web - HTTP/HTML
- SMTP (Simple Mail Protocol)
- Web Services
- Teradici PCoIP
- Windows Sockets

Filter: ? X

Script Name: Orngehrm_script

Location: D:\Orngehrm_Mod5

Solution Name: Orange_sln Create folder for solution

Solution Target: D:\Orngehrm_Mod5\Orange_sln\Orange_sln.ltsn

Create Cancel

Activate Windows
Go to Settings to activate Windows.

Ready Type here to search 16:16 24-02-2024

The screenshot shows the LoadRunner code editor with the file 'Orangehrm_script : Action.c' open. The code is as follows:

```
1  Action()
2  {
3      return 0;
4  }
5
```

The 'Solution Explorer' window on the left shows the same structure as the previous screenshot. The status bar at the bottom shows 'Script parsing succeeded'.

Action.c

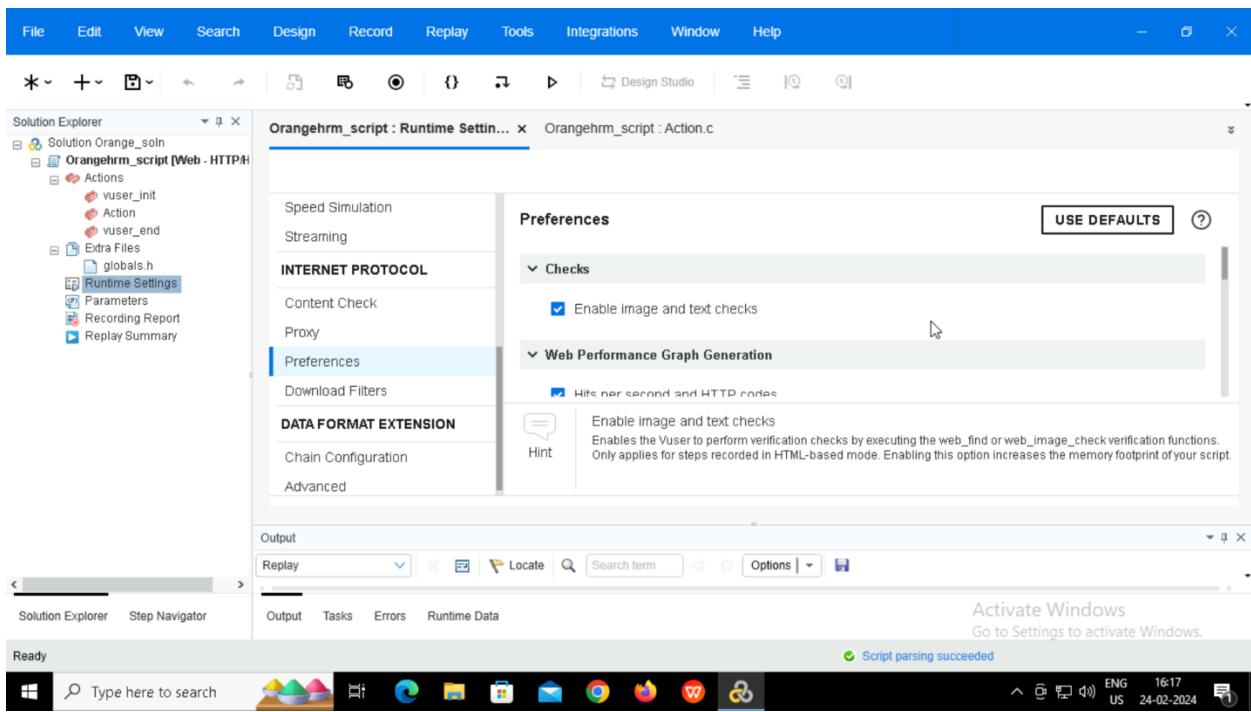
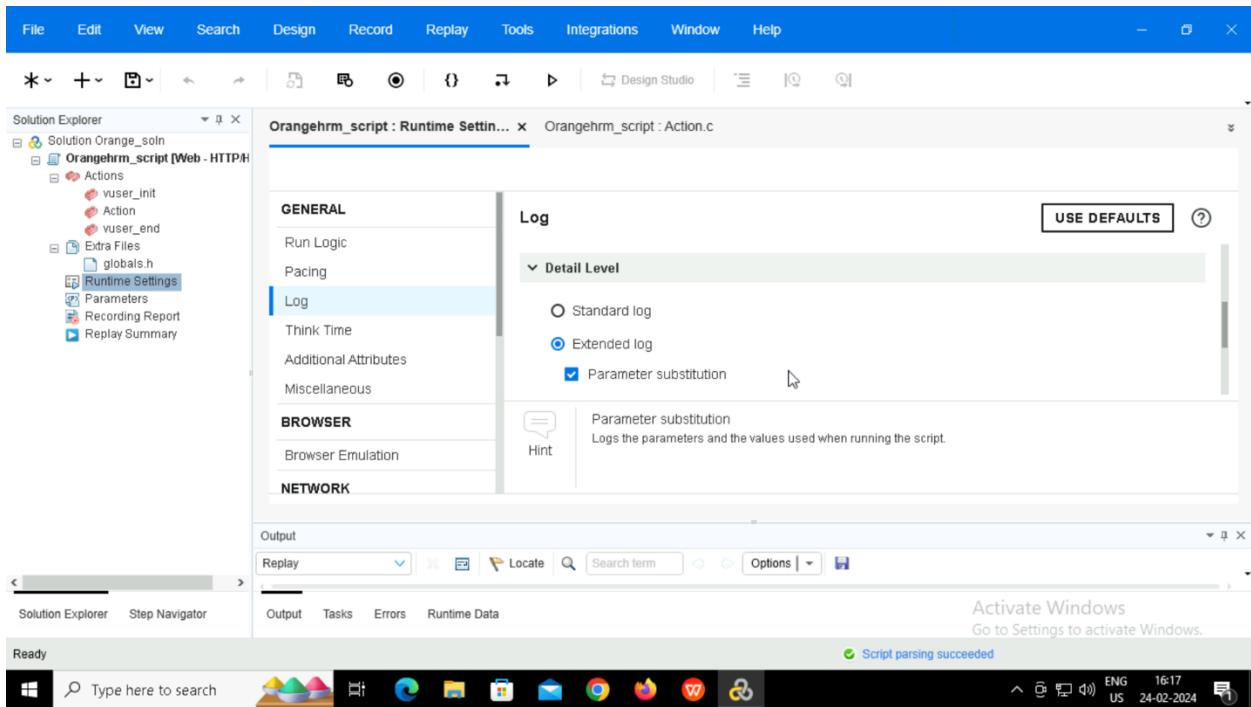
```
1  Action()
2  {
3      return 0;
4  }
5
```

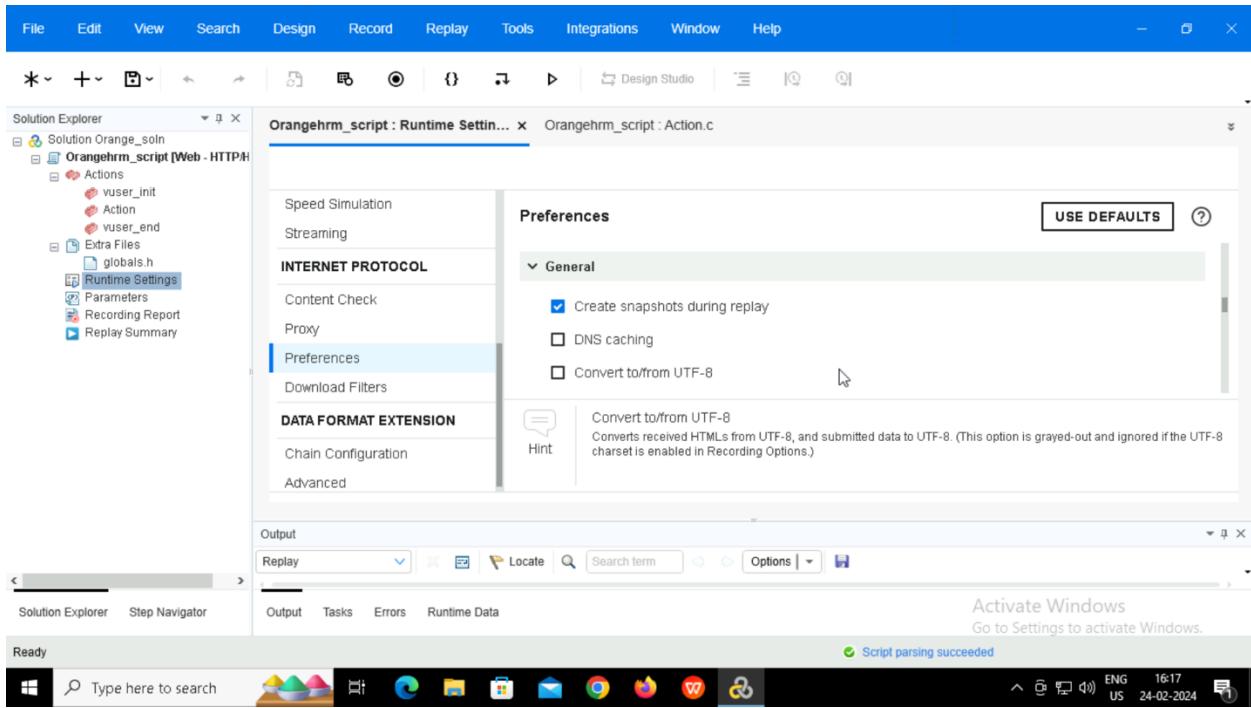
Output

Activate Windows
Go to Settings to activate Windows.

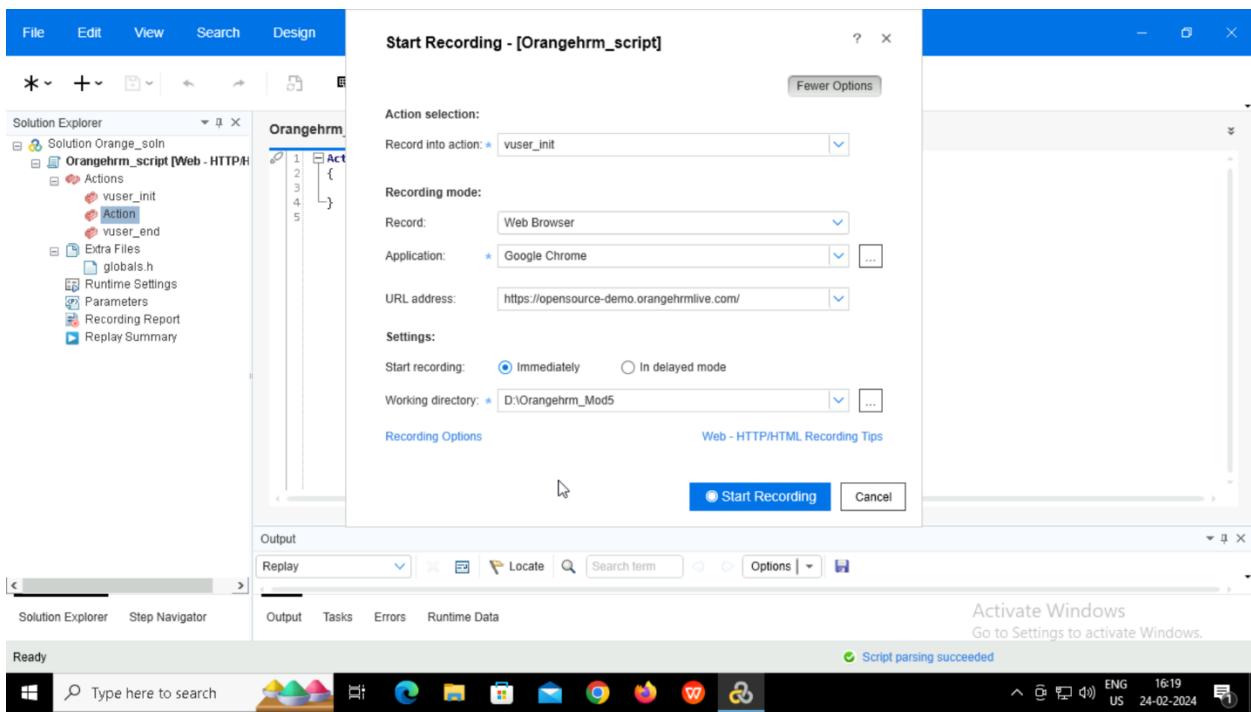
Ready Type here to search 16:16 24-02-2024

Setting the runtime settings

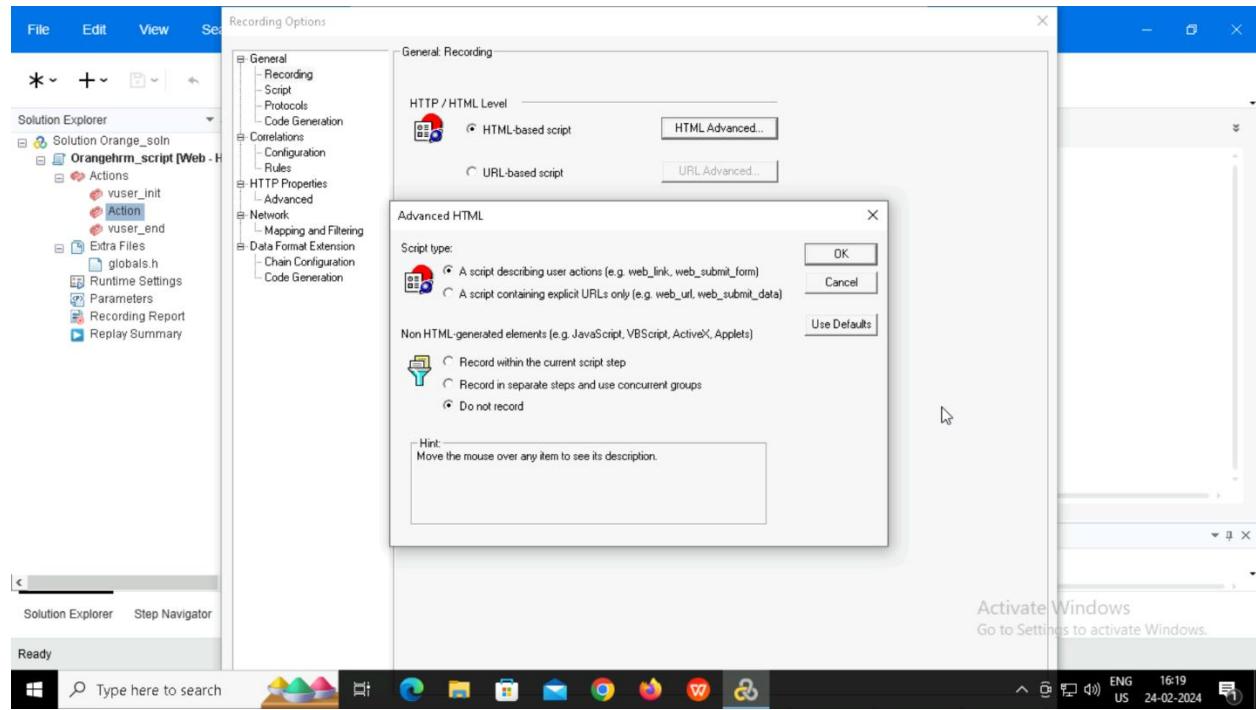
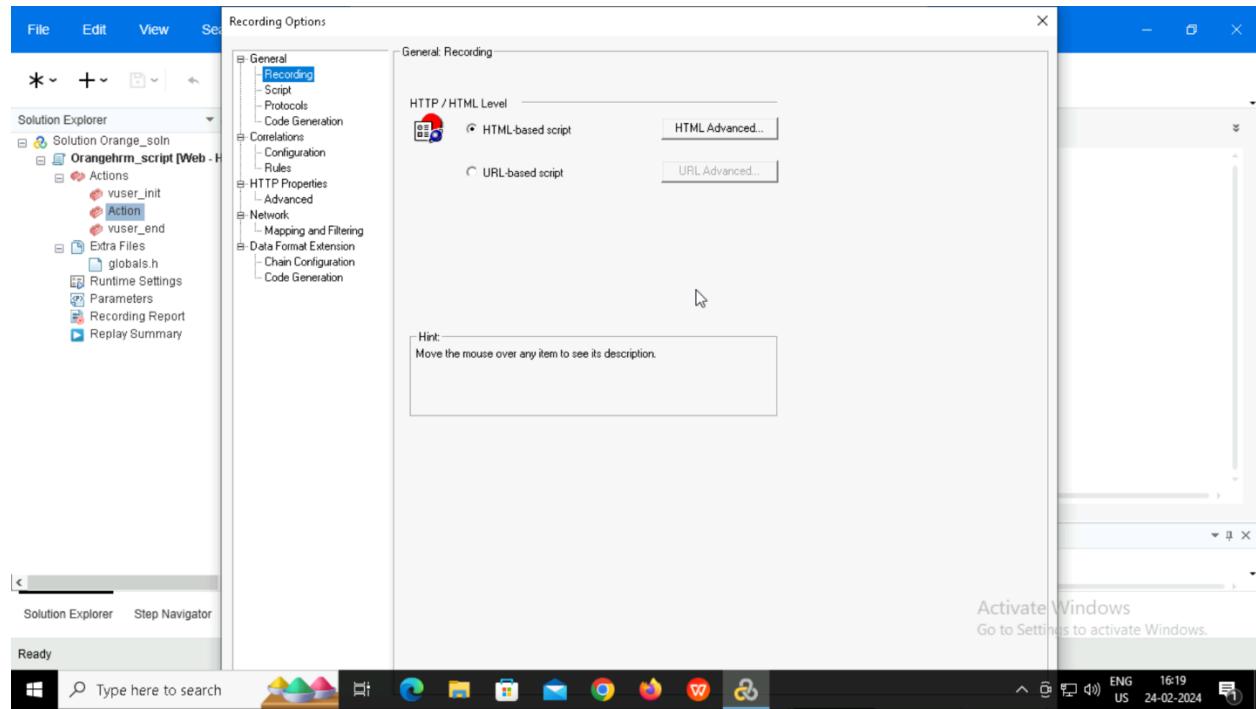


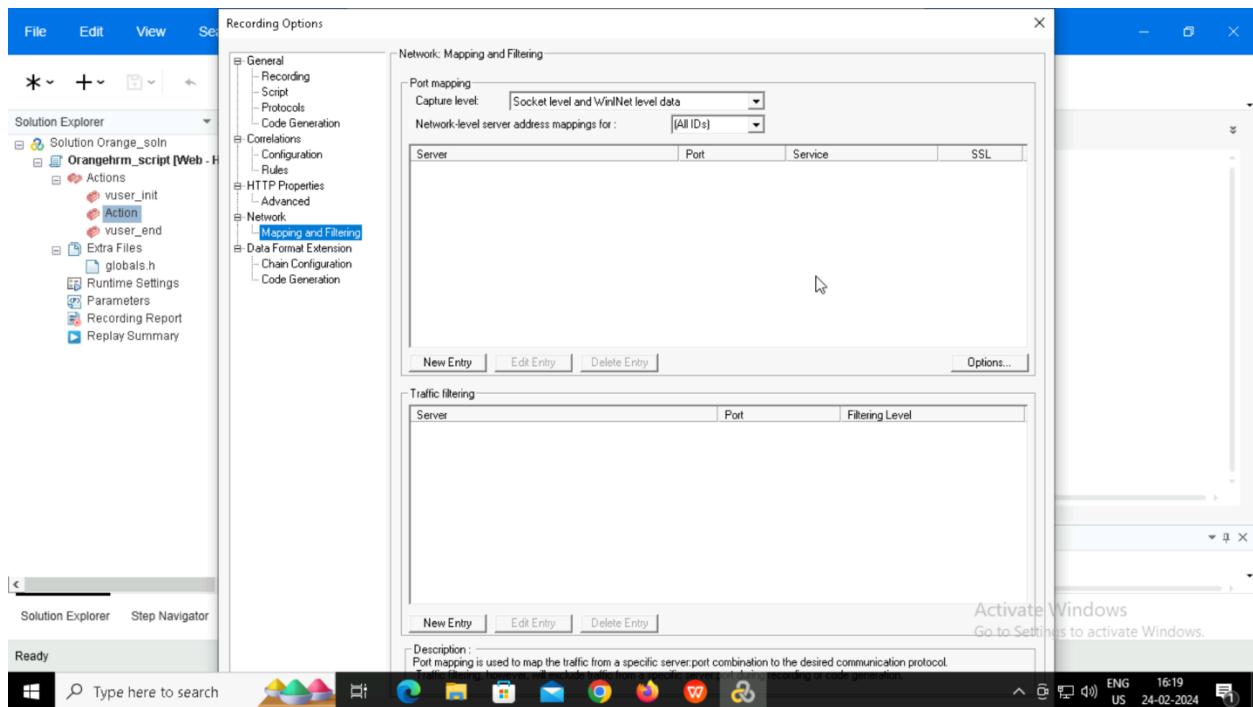
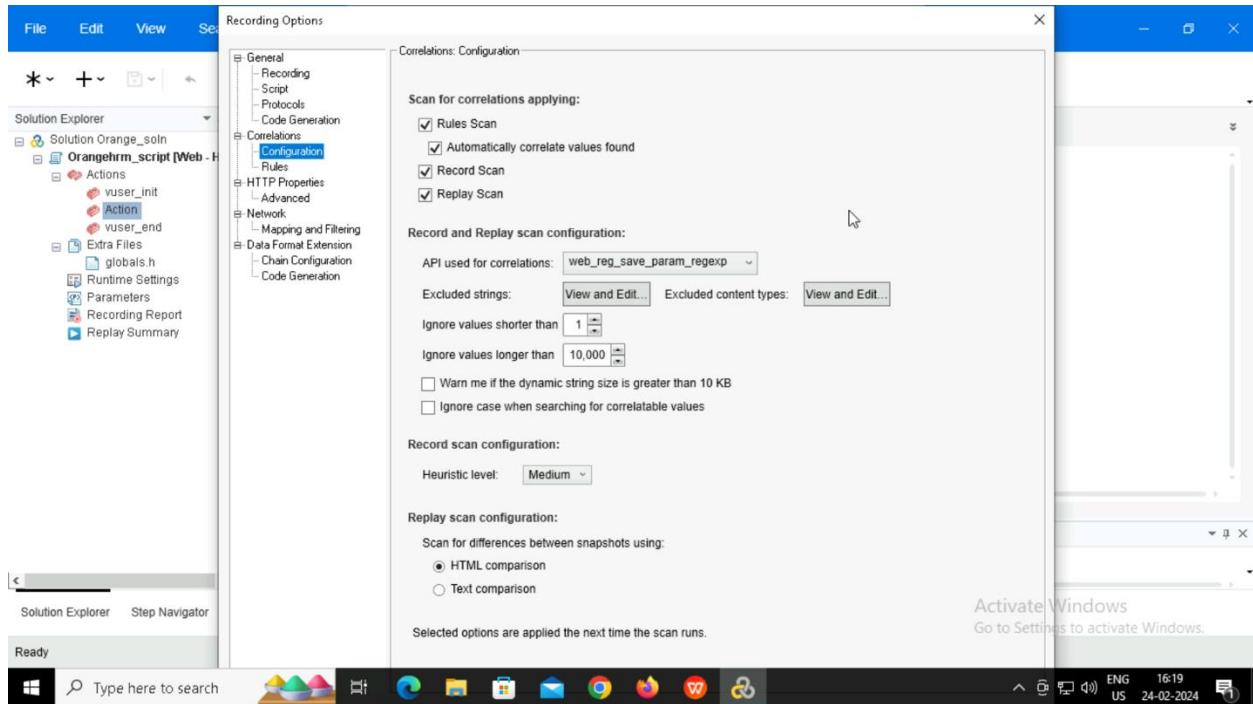


Recording the website



Recording options





After recording codes appearing in vuser init, actions and vuser end

Solution Explorer

Orangehrm_script : vuser_end.c Orangehrm_script : vuser_init.c Orangehrm_script : Action.c

```

1  /* 
2
3
4
5
6
7
8  vuser_init()
9  {
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
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26
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29
  web_set_sockets_option("SSL_VERSION", "AUTO");
  /*Possible OAUTH authorization was detected. It is recommended to correlate the authorization parameters.*/
  web_url("opensource-demo.orangehrmlive.com",
  "URL=https://opensource-demo.orangehrmlive.com",
  "Resource=0",
  "ReContentype=text/html",
  "Referer=",
  "Snapshot=t1.inf",
  "Mode=HTML",
  LAST);
  web_url("messages",
  "URL=https://opensource-demo.orangehrmlive.com/web/index.php/core/i18n/messages",
  "Resource=0",
  "ReContentype=application/json",
  "Referer=https://opensource-demo.orangehrmlive.com/web/index.php/auth/login",
  LAST);

```

Output

Script parsing succeeded In 211 col 5

Activate Windows Go to Settings to activate Windows.

Ready

Type here to search

File Edit View Search Design Record Replay Tools Integrations Window Help

Solution Explorer

Orangehrm_script : vuser_end.c Orangehrm_script : vuser_init.c Orangehrm_script : Action.c

```

1  Action()
2  {
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
  /* login */
  web_submit_data("validate",
  "Action=https://opensource-demo.orangehrmlive.com/web/index.php/auth(validate",
  "Method=POST",
  "ReContentype=text/html",
  "Referer=https://opensource-demo.orangehrmlive.com/web/index.php/auth/login",
  "Snapshot=t3.inf",
  "Node=HTML",
  ITEMDATA,
  "Name_token", "Value=399f15e57d85cab6b1d0.swZJFdtL_SAkHQ1zwxeAiEBeY5J30y0vuB5lf jpg.-3qiCIHHTaTR8jgUp1QsORRBT5J6SpGi Ir",
  "Name=username", "Value=Admin", ENDITEM,
  "Name=password", "Value=admin123", ENDITEM,
  LAST);
  web_set_sockets_option("TLS_SNI", "1");
  web_url("action-summary",
  "URL=https://opensource-demo.orangehrmlive.com/web/index.php/v2/dashboard/employees/action-summary",
  "Resource=0",

```

Output

Script parsing succeeded In 211 col 5

Activate Windows Go to Settings to activate Windows.

Ready

Type here to search

File Edit View Search Design Record Replay Tools Integrations Window Help

The screenshot shows a software interface with a blue header bar containing 'File', 'Edit', 'View', 'Search', 'Design', 'Record', 'Replay', 'Tools', 'Integrations', 'Window', and 'Help' menus. Below the header is a toolbar with various icons. The main area has a 'Solution Explorer' pane on the left listing files like 'Orangehrm_script [Web - HTTP/HTML]', 'Actions', 'vuser_init', 'Action', 'vuser_end', 'Extra Files', 'globals.h', 'Runtime Settings', 'Parameters', 'Recording Report', and 'Replay Summary'. The central pane displays a C-like script code for 'vuser_end()' with comments and URLs. At the bottom is an 'Output' pane with tabs for 'Replay', 'Tasks', 'Errors', and 'Runtime Data'. A taskbar at the very bottom shows icons for various applications.

```

1 vuser_end()
{
2
3     /* logout */
4
5     web_url("logout",
6         "URL=https://opensource-demo.orangehrmlive.com/web/index.php/auth/logout",
7         "Resource=0",
8         "RecContentType=text/html",
9         "Referer=https://opensource-demo.orangehrmlive.com/web/index.php/admin/viewSystemUsers",
10        "Snapshot=t25.inf",
11        "Mode=HTML",
12        LAST);
13
14
15     return 0;
16 }
```

When replaying the script Authentication error appeared

The screenshot shows a software interface similar to the previous one, with a blue header bar and a toolbar. The 'Solution Explorer' pane is visible on the left. The central pane displays a 'Replay Summary' for a script named 'Orangehrm_script'. It shows a red 'X' icon and the message 'Script failed' with '2 replay error(s) detected'. Below this, it shows 'Elapsed time: 00:00:07.024 h:m:s.m' and 'Started at: 24-02-2024 16:28:10'. The 'Output' pane at the bottom shows a detailed log of errors, starting with 'Replay status failed' and 'View summary Started at: 24-02-2024 16:28:10 Elapsed time: 00:00:07'. The log lists numerous errors, including 'Action.c(6): Resource "https://opensource-demo.orangehrmlive.com/web/dist/js/chunk-vendors.js?v=1706326081969" is in the cache already and will no longer be loaded.', 'Action.c(6): Resource "https://opensource-demo.orangehrmlive.com/web/dist/js/app.js?v=1706326081969" is in the cache already and will no longer be loaded.', 'Action.c(6): web_submit_data("validate") was successful, 4194 body bytes, 2193 header bytes, 24 chunking overhead bytes [MsgId: MMSG-26392]', and 'Action.c(19): web_set_sockets_option started [MsgId: MMSG-26355]'. The taskbar at the bottom is identical to the one in the first screenshot.

Script Name: Orangehrm_script

Elapsed time: 00:00:07.024 h:m:s.m Started at: 24-02-2024 16:28:10

Output

Replay status failed [View summary](#) Started at: 24-02-2024 16:28:10 Elapsed time: 00:00:07

```

Action.c(6): Resource "https://opensource-demo.orangehrmlive.com/web/dist/js/chunk-vendors.js?v=1706326081969" is in the cache already and will no longer be loaded.
Action.c(6): Resource "https://opensource-demo.orangehrmlive.com/web/dist/js/app.js?v=1706326081969" is in the cache already and will no longer be loaded.
Action.c(6): web_submit_data("validate") was successful, 4194 body bytes, 2193 header bytes, 24 chunking overhead bytes [MsgId: MMSG-26392]
Action.c(19): web_set_sockets_option started [MsgId: MMSG-26355]
Action.c(19): web_set_sockets_option was successful [MsgId: MMSG-26355]
Action.c(21): web_url("action-summary") started [MsgId: MMSG-26355]
Action.c(21): web_url("action-summary") started [MsgId: MMSG-26355]
Action.c(21): Error -26546: Authentication required, please use "web_set_user", e.g. web_set_user("domain\user", "password", "host:port")
Action.c(21): Error -26629: HTTP Status Code=401 (Unauthorized) for "https://opensource-demo.orangehrmlive.com/web/index.php/api/v2/dashl"
Action.c(21): web_url("action-summary") highest severity level was "ERROR", 52 body bytes, 265 header bytes, 11 chunking overhead bytes
Ending action Action.
Ending iteration 1.
Ending Vuser...
```

So, for authenticating in replay, we have to set up correlation.

Setting up the auto correlation

Design Studio

Correlation(2) Async

Review the dynamic values found and select those that need to be correlated.
Click Replay & Scan until no more dynamic values are found.

Correlate Add as Rule... Undo Correlation Discard View: All

Type	Replace/Found	Status	Text in Response	Correlation Parameter
Record	1/1	New	399f15e57d85cab6b1d0.swvZJFdTL_SAkJHOIzwxeAWEeBeYS	_token
Replay	9/9	New	dashboard	CorrelationParameter

2 results

Details Options Close

Design Studio

Correlation(2) Async

Review the dynamic values found and select those that need to be correlated.
Click Replay & Scan until no more dynamic values are found.

1 item(s) are correlated

Correlate Add as Rule... Undo Correlation Discard View: All

Type	Replace/Found	Status	Text in Response	Correlation Parameter
Record	1/1	Applied	399f15e57d85cab6b1d0.swvZJFdTL_SAkJHOIzwxeAWEeBeYS	_token
Replay	9/9	New	dashboard	CorrelationParameter

2 results

Details Options Close

Solution Explorer Orangehrm_script : vuser_end.c Orangehrm_script : vuser_init.c* Orangehrm_script : Action.c*

```

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```

```

/* Possible OAuth authorization was detected. It is recommended to correlate the authorization parameters.*/
/*Correlation comment - Do not change! Original value='399f15e57d85cab6b1d0.swvZJFdtL_SAhQlwxeAWEeBeYSJ30y0vuwBSMfjpg.-3qWCWEHTa
"ParamName=_token",
"RegExquot;(.*)&quot;",
SEARCH_FILTERS,
"scope=body",
"ignoreRedirections=Yes",
"RequestUrl=*logIn",
LAST);

web_url("opensource-demo.orangehrmlive.com",
"URL=https://opensource-demo.orangehrmlive.com",
"Resource=0",
"RecContentType=text/html".

```

Output

Replay status failed View summary Started at: 24-02-2024 16:28:10 Elapsed time: 00:00:07

Action.c(6): Resource "https://opensource-demo.orangehrmlive.com/web/dist/js/chunk-vendors.js?v=1706326081969" is in the cache already and will not be loaded again.

Action.c(6): Resource "https://opensource-demo.orangehrmlive.com/web/dist/js/app.js?v=1706326081969" is in the cache already and will not be loaded again.

Action.c(6): web_submit_data("validate") was successful, 4194 body bytes, 2193 header bytes, 24 chunking overhead bytes [MsgId: MMSG-1]

Solution Explorer Step Navigator Output Tasks Errors Runtime Data

Activate Windows Go to Settings to activate Windows.

Replay status failed Script parsing succeeded In 94 col 35

Solution Explorer Orangehrm_script : vuser_end.c Orangehrm_script : vuser_init.c* Orangehrm_script : Action.c*

```

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```

```

/* login */

web_submit_data("validate",
"Action=https://opensource-demo.orangehrmlive.com/web/index.php/auth(validate",
"Method=POST",
"RecContentType=text/html",
"Referer=https://opensource-demo.orangehrmlive.com/web/index.php/auth/login",
"Snapshot=t3.inf",
"Node=HTML",
ITEMDATA,
"Name=_token", "Value={_token}", ENDITEM,
"Name=username", "Value=Admin", ENDITEM,
"Name=password", "Value=admin123", ENDITEM,
LAST);

web_set_sockets_option("TLS_SNI", "1");

```

Output

Replay status failed View summary Started at: 24-02-2024 16:28:10 Elapsed time: 00:00:07

Action.c(6): Resource "https://opensource-demo.orangehrmlive.com/web/dist/js/chunk-vendors.js?v=1706326081969" is in the cache already and will not be loaded again.

Action.c(6): Resource "https://opensource-demo.orangehrmlive.com/web/dist/js/app.js?v=1706326081969" is in the cache already and will not be loaded again.

Action.c(6): web_submit_data("validate") was successful, 4194 body bytes, 2193 header bytes, 24 chunking overhead bytes [MsgId: MMSG-1]

Solution Explorer Step Navigator Output Tasks Errors Runtime Data

Activate Windows Go to Settings to activate Windows.

Replay status failed Script parsing succeeded In 94 col 35

Parameterization – parameterizing the 2 variables username and password

Parameter type: File

File path: credential.dat

Add Column... Add Row... Delete Column... Delete Row...

username	password
1 Admin	admin123

Edit with Notepad... Import Values Simulate Parameter...

Select column: By name: username

File format: Column delimiter: Comma First data line: 1

Select next row: Sequential

Update value on: Each iteration

When out of values: Continue with last value

Allocate Vuser values in the Controller:

- Automatically allocate block size
- Allocate _____ values for each Vuser

Close

Activate Windows
Go to Settings to activate Windows.

In 16 col 43

Script parsing succeeded

Parameter type: File

File path: credential.dat

Add Column... Add Row... Delete Column... Delete Row...

username	password
1 Admin	admin123

Edit with Notepad... Import Values Simulate Parameter...

Select column: By name: password

File format: Column delimiter: Comma First data line: 1

Select next row: Sequential

Update value on: Each iteration

When out of values: Continue with last value

Allocate Vuser values in the Controller:

- Automatically allocate block size
- Allocate _____ values for each Vuser

Close

Activate Windows
Go to Settings to activate Windows.

In 16 col 43

Script parsing succeeded

The screenshot shows the Orangehrm_script application interface. The top menu bar includes File, Edit, View, Search, Design, Record, Replay, Tools, Integrations, Window, and Help. Below the menu is a toolbar with various icons. The left sidebar is the Solution Explorer, showing a project named "Orangehrm_script [Web - HTTP/HTML]" containing files like vuser_init.c, Action.c, vuser_end.c, and Extra Files. The main area is a code editor displaying C code related to web interactions with an OrangeHRM live demo. The code includes actions for validating authentication and fetching an action summary. The bottom right corner displays a message: "Activate Windows Go to Settings to activate Windows." The bottom status bar shows the current file path as "Replay status failed", the line number as "In 18", and the column number as "col 1".

```
Action=https://opensource-demo.orangehrmlive.com/web/index.php/auth/validate",
Method=POST",
ReContent-Type=text/html",
Referer=https://opensource-demo.orangehrmlive.com/web/index.php/auth/login",
Snapshot=t3.inf",
Mode=HTML",
ITEMDATA,
"Name=_token", "Value={_token}", ENDITEM,
"Name=username", "Value=username", ENDITEM,
"Name=password", "Value={password}", ENDITEM,
LAST);

web_set_sockets_option("TLS_SNI", "1");

web_url("action-summary",
"URL=https://opensource-demo.orangehrmlive.com/web/index.php/api/v2/dashboard/employees/action-summary",
"Resource=0".
```

Replaying the recorded script

The screenshot shows the 'Orangehrm_script : Replay Summary' window in Design Studio. The window displays the following details:

- Script Name:** Orangehrm_script
- Status:** Script passed (indicated by a green checkmark icon)
- Elapsed time:** 00:00:24.765 hh:mm:ss
- Started at:** 24-02-2024 16:33:57
- Ended at:** 24-02-2024 16:34:22

Below the summary, there is a note: "For additional network traffic details, enable the generation of NV Insights Report." A "Choose:" dropdown menu is present.

Output:

Replay

Reply status passed View summary Started at: 24-02-2024 16:33:57 Elapsed time: 00:00:24
vuser_end.c(b): web_URI(logout) was successful, 4000 body bytes, 2224 header bytes, 24 chunking overhead bytes LMSGID: FMSU-26383
Ending action vuser_end.
Vuser Terminated.

Solution Explorer Step Navigator

Activate Windows
Go to Settings to activate Windows.

File Edit View Search Design Record Replay Tools Integrations Window Help

Design Studio

Solution Explorer

Orangehrm_script [Web - HTTP/HTML]

- Actions
 - vuser_init
 - Action
 - vuser_end
- Extra Files
- globals.h
- Runtime Settings
- Parameters
- Recording Report
- Replay Summary

Save HAR File Export to PDF

Output Tasks Errors Runtime Data

Type here to search

16:34 24-02-2024 ENG US

Token is correlating and parameterization also works

The screenshot shows the LoadRunner interface with the "Replay Summary" tab selected. The "Script Name" is "Orangehrm_script". A green checkmark indicates "Script passed". The "Output" pane displays log messages from the replay session:

```

vuser_init.c(44): web_set_sockets_option started [MsgId: MMMSG-26355]
vuser_init.c(44): web_set_sockets_option was successful [MsgId: MMMSG-26392]
Ending action vuser_init.
Running Vuser...
Starting iteration 1.
Warning -27077: The "vuser_init" section contains web function(s) when the "Simulate a new user on each iteration" Runtime Setting is ON
Maximum number of concurrent connections per server: 6 [MsgId: MMMSG-26989]
Starting action Action.
Action.c(6): web_submit_data("validate") started [MsgId: MMMSG-26355]
Action.c(6): Notify: Parameter Substitution: parameter "token" = "a996049b56.if-5Uysqt5IEWHTFGot6YTItgNea3t0nkHVdzCD0Fa4.pLT6A31e3aR3M"
Action.c(6): Notify: Parameter Substitution: parameter "username" = "Admin"
Action.c(6): Notify: Parameter Substitution: parameter "password" = "admin123"
Action.c(6): Redirecting "https://opensource-demo.orangehrmlive.com/web/index.php/auth(validate" (redirection depth is 0) [MsgId: MMMSG-26693]
Action.c(6): To location "https://opensource-demo.orangehrmlive.com/web/index.php/dashboard/Index" [MsgId: MMMSG-26693]

```

The status bar at the bottom shows "Replay status passed" and "Script parsing succeeded".

Recording Report

The screenshot shows the LoadRunner interface with the "Recording Rep..." tab selected. It displays a summary table with the following data:

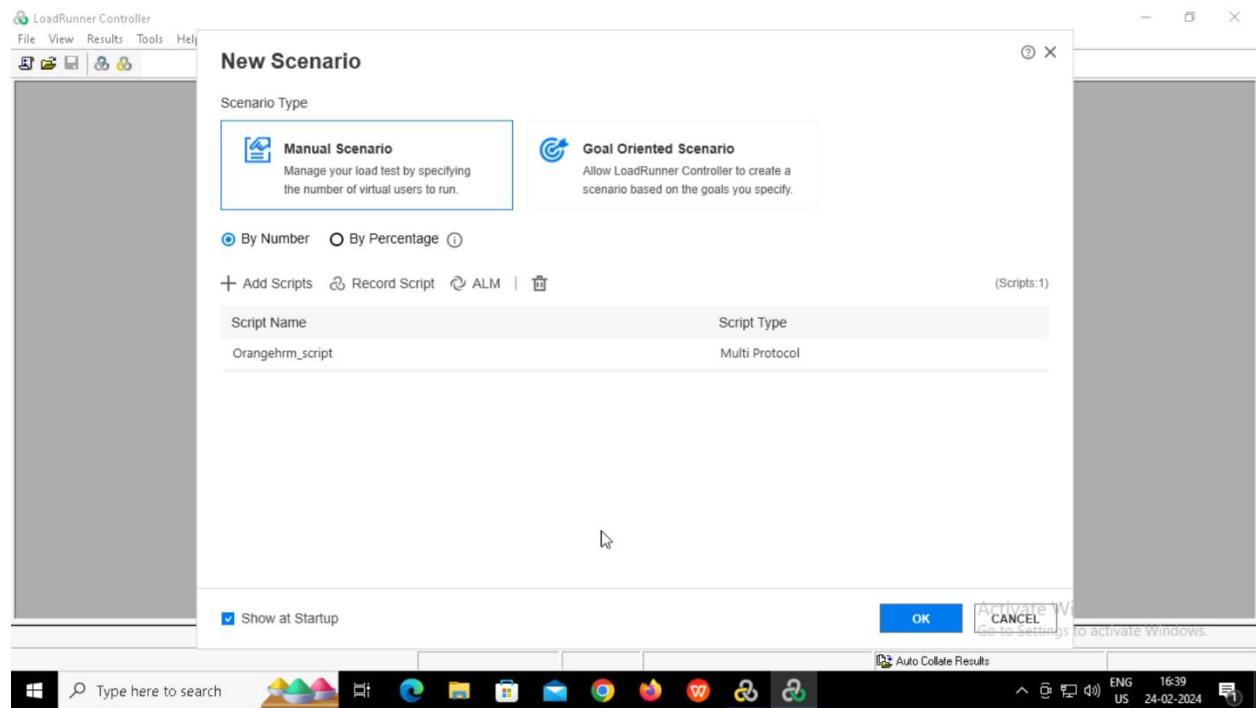
TOTAL SIZE	SENT	RECEIVED	REQUESTS	CONNECTIONS	DATE & TIME	RECORDING DATE	DURATION
55.423 KB	4,591.833 KB		62	12		2/24/2024	00:01:37

Below the table, there are sections for "Headers" (20 Headers recorded), "Hosts", and "Runtime Data". The "Runtime Data" table shows:

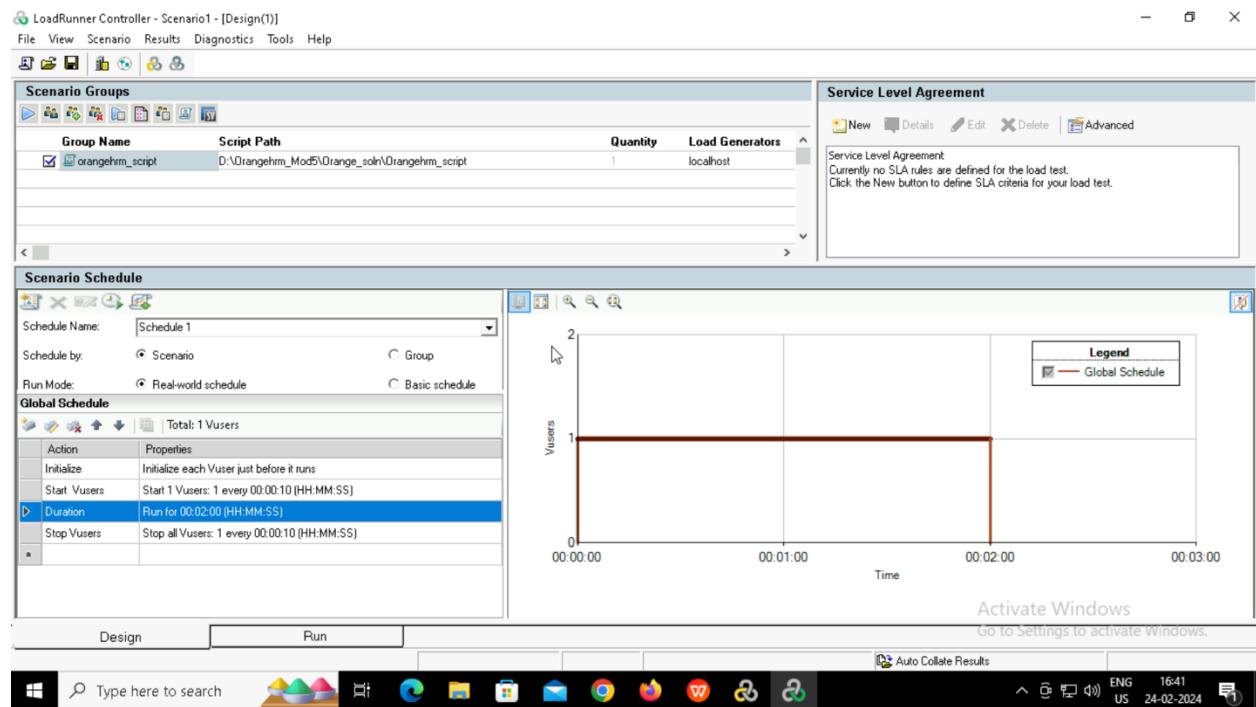
Name	Value	Type
Flashed time (hh:mm:ss)	00:00:24	

The status bar at the bottom shows "Replay status passed" and "Script parsing succeeded".

Opening the LoadRunner controller and opening the same script created earlier



Setting up the time for scenario



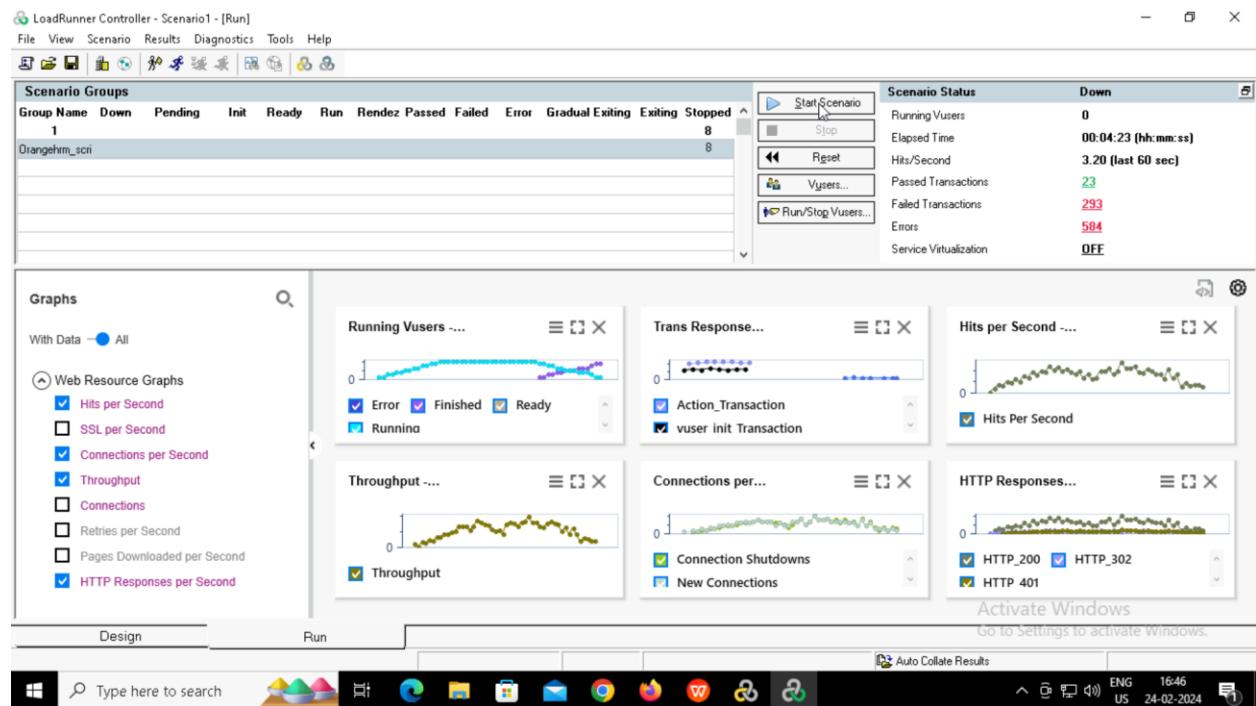
Setting up the number of users

The screenshot shows the LoadRunner Controller interface. In the center, a modal dialog titled "Vusers(8)" displays a table of 8 virtual users. Each user is assigned the script "Orngehm_script" and runs on "localhost". The "Status" column shows all users as "Down". To the right of the table is a "Service Level Agreement" panel with a message: "Test your load test." Below the table is a graph showing a step function starting at 0:04:00. On the left side of the main window, there's a "Scenario Groups" tree view and a "Scenario Schedule" section. The "Schedule Name" is "Schedule 1", "Schedule by" is "Scenario", and "Run Mode" is "Real-world schedule". A "Global Schedule" table shows actions like "Initialize", "Start Users", "Duration", and "Stop Users". At the bottom, tabs for "Design" and "Run" are visible, along with a taskbar.

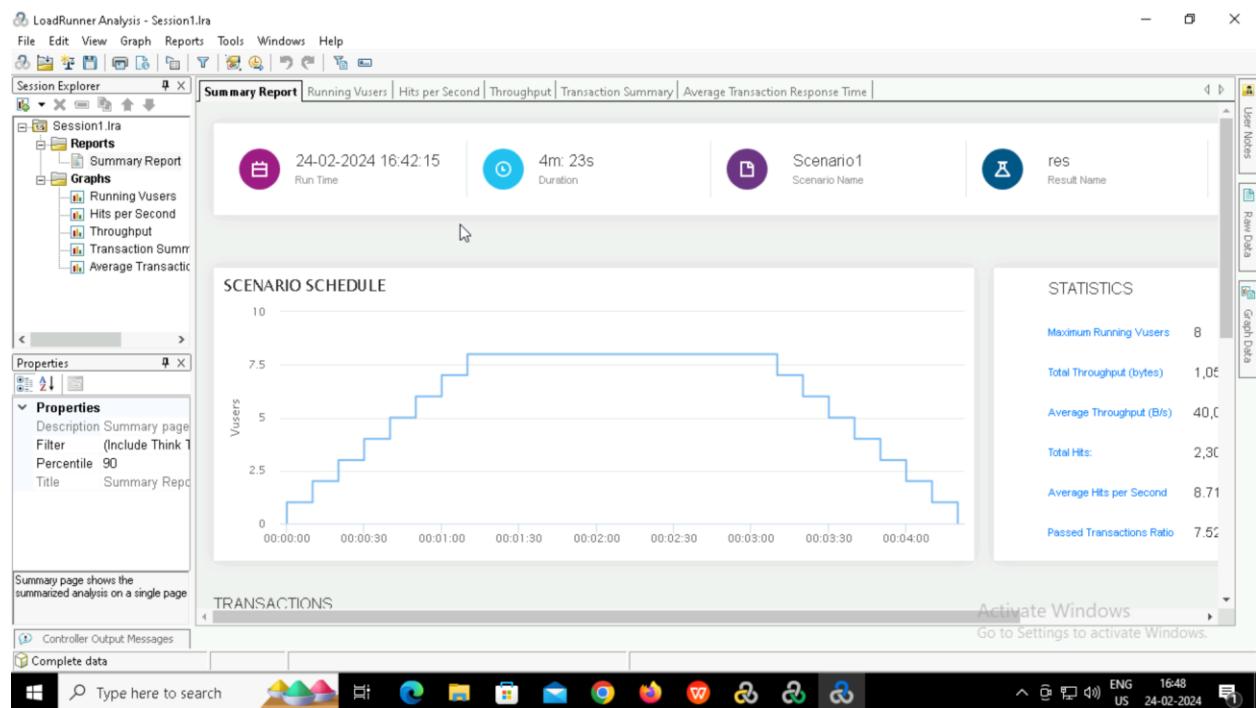
Runtime settings

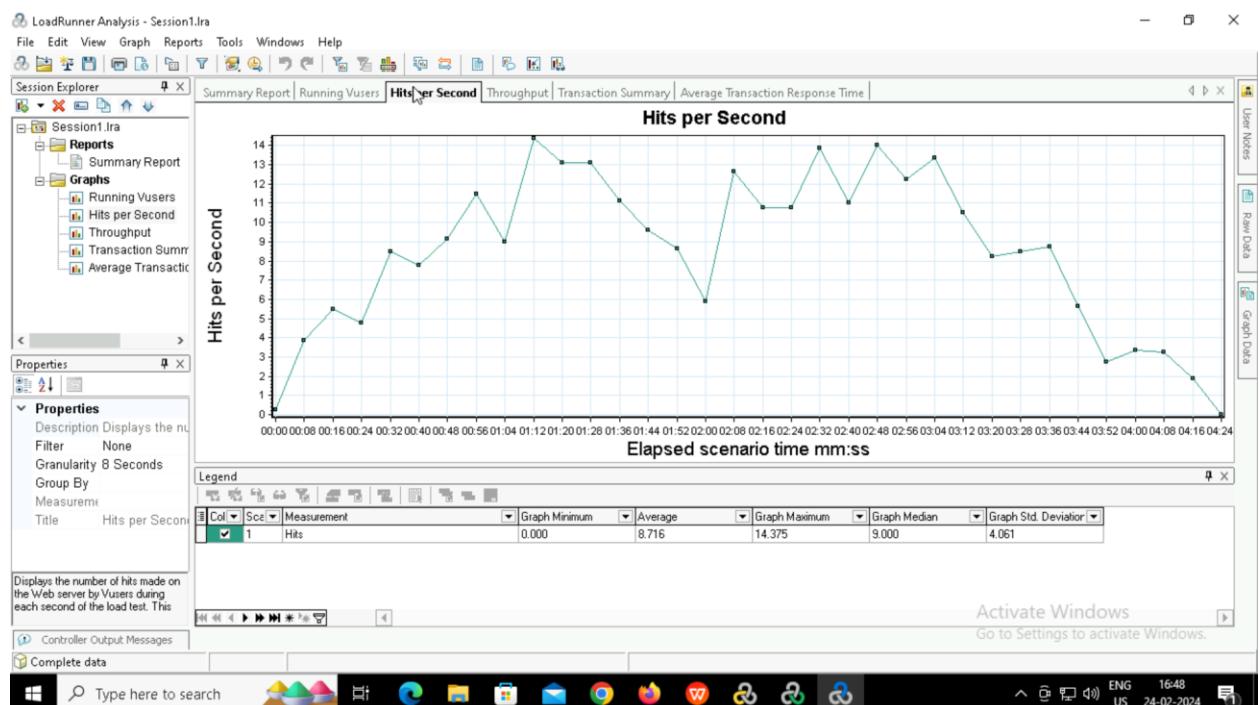
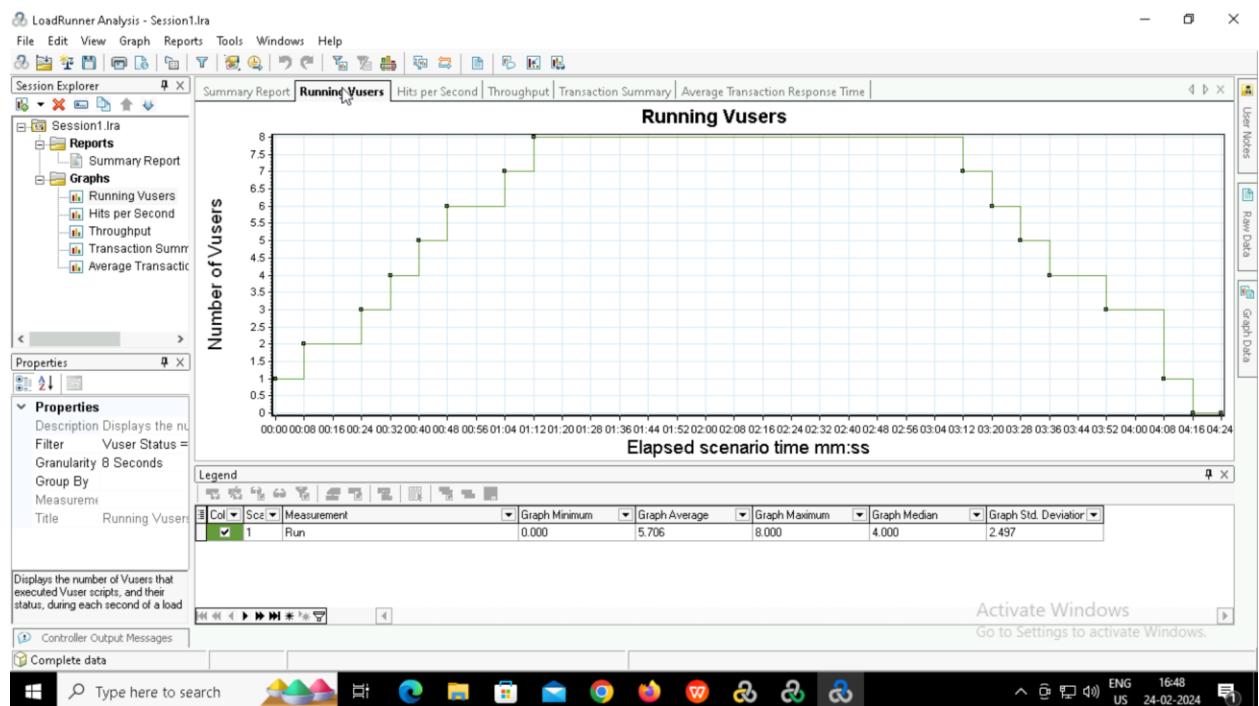
This screenshot shows the "Runtime Settings" dialog box open in the LoadRunner Controller. The left sidebar lists categories: GENERAL, BROWSER, and NETWORK. Under GENERAL, "Run Logic" is selected. The "Run Logic" tab shows "Number of iterations" set to 2. Below this, there are sections for "initialize" (containing "vuser_init") and "run" (containing "(2) run"). A "Hint" box provides information about the Run Logic View. At the bottom right of the dialog is a "SAVE" button. The background shows the same "Vusers(8)" dialog and scenario schedule from the previous screenshot.

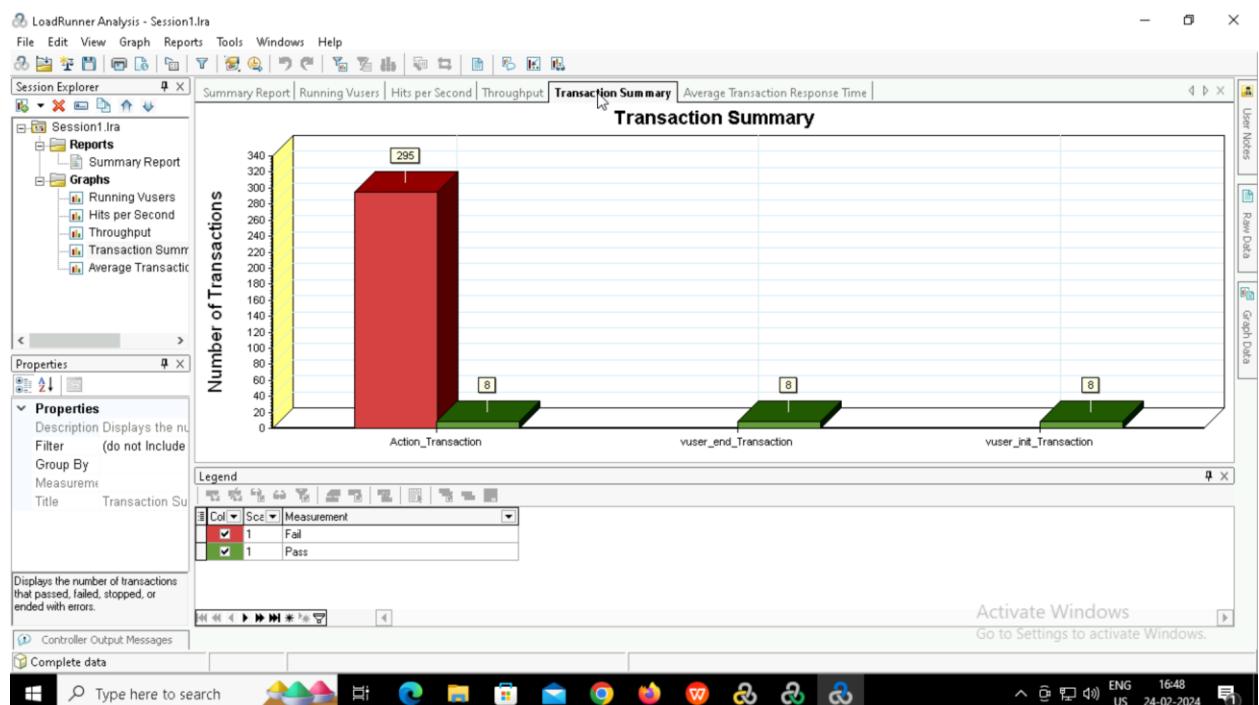
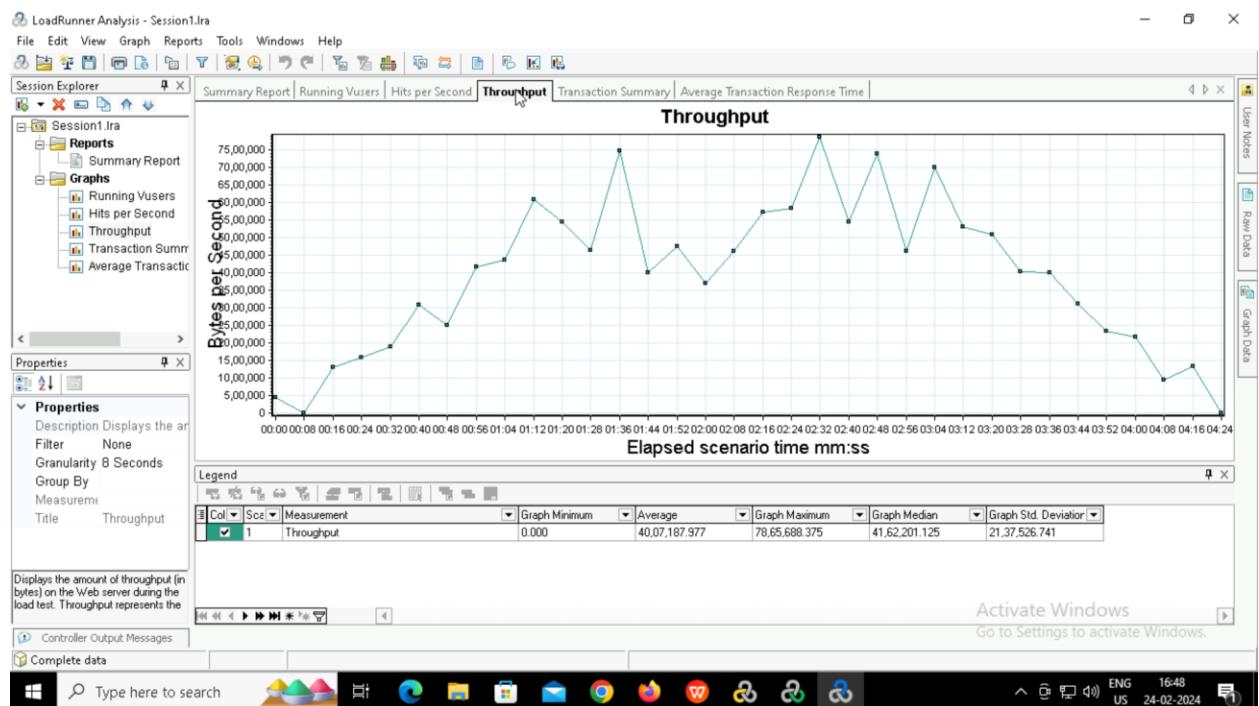
Running the scenario and applying different graphs

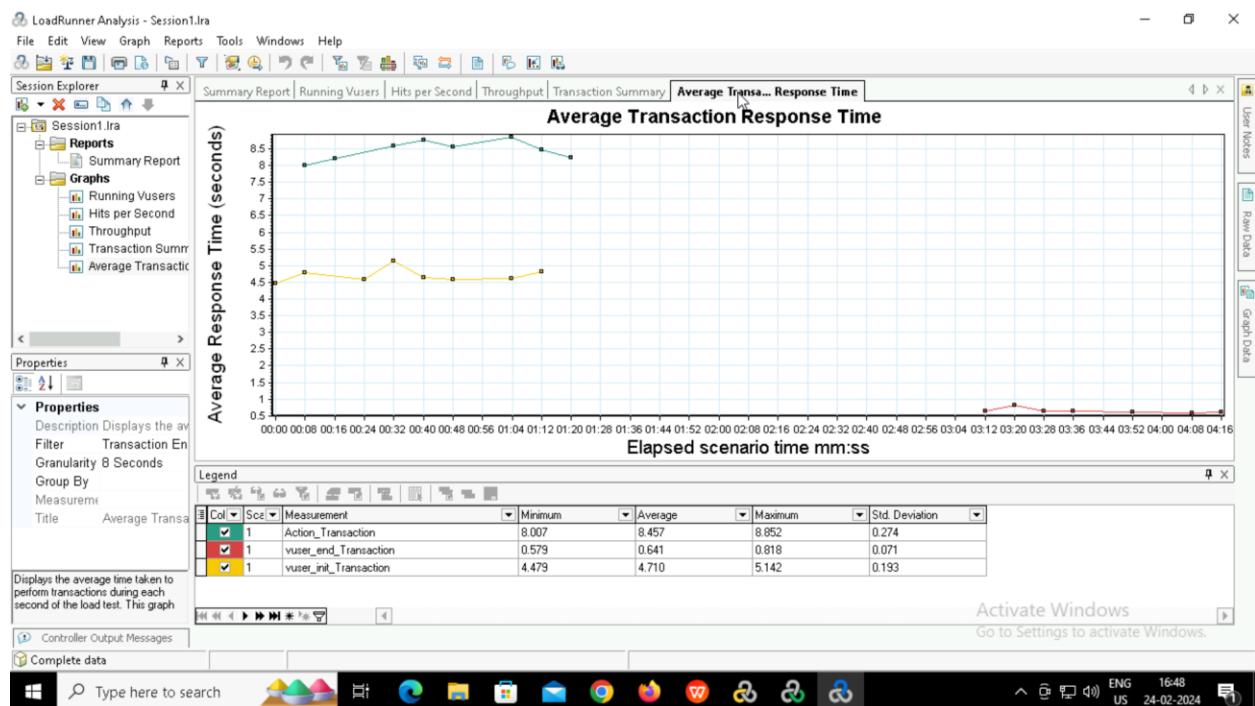


Opening the Loadrunner Analysis and viewing the graph









Generating the html report for viewing

