

# LoadRunner interview questions

Testing, Windows interview questions

1. **What is load testing?** - Load testing is to test that if the application works fine with the loads that result from large number of simultaneous users, transactions and to determine whether it can handle peak usage periods.
  2. **What is Performance testing?** - Timing for both read and update transactions should be gathered to determine whether system functions are being performed in an acceptable timeframe. This should be done standalone and then in a multi user environment to determine the effect of multiple transactions on the timing of a single transaction.
  3. **Did u use LoadRunner? What version?** - Yes. Version 7.2.
  4. **Explain the Load testing process?** -  
**Step 1: Planning the test.** Here, we develop a clearly defined test plan to ensure the test scenarios we develop will accomplish load-testing objectives. **Step 2: Creating Vusers.** Here, we create Vuser scripts that contain tasks performed by each Vuser, tasks performed by Vusers as a whole, and tasks measured as transactions. **Step 3: Creating the scenario.** A scenario describes the events that occur during a testing session. It includes a list of machines, scripts, and Vusers that run during the scenario. We create scenarios using LoadRunner Controller. We can create manual scenarios as well as goal-oriented scenarios. In manual scenarios, we define the number of Vusers, the load generator machines, and percentage of Vusers to be assigned to each script. For web tests, we may create a goal-oriented scenario where we define the goal that our test has to achieve. LoadRunner automatically builds a scenario for us. **Step 4: Running the scenario.**  
We emulate load on the server by instructing multiple Vusers to perform tasks simultaneously. Before the testing, we set the scenario configuration and scheduling. We can run the entire scenario, Vuser groups, or individual Vusers. **Step 5: Monitoring the scenario.**  
We monitor scenario execution using the LoadRunner online runtime, transaction, system resource, Web resource, Web server resource, Web application server resource, database server resource, network delay, streaming media resource, firewall server resource, ERP server resource, and Java performance monitors. **Step 6: Analyzing test results.** During scenario execution, LoadRunner records the performance of the application under different loads. We use LoadRunner's graphs and reports to analyze the application's performance.
  5. **When do you do load and performance Testing?** - We perform load testing once we are done with interface (GUI) testing. Modern system architectures are large and complex. Whereas single user testing primarily on functionality and user interface of a system component, application testing focuses on performance and reliability of an entire system. For example, a typical application-testing scenario might depict 1000 users logging in simultaneously to a system. This gives rise to issues such as what is the response time of the system, does it crash, will it go with different software applications and platforms, can it hold so many
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- hundreds and thousands of users, etc. This is when we set do load and performance testing.
6. **What are the components of LoadRunner?** - The components of LoadRunner are The Virtual User Generator, Controller, and the Agent process, LoadRunner Analysis and Monitoring, LoadRunner Books Online.
  7. **What Component of LoadRunner would you use to record a Script?** - The Virtual User Generator (VuGen) component is used to record a script. It enables you to develop Vuser scripts for a variety of application types and communication protocols.
  8. **What Component of LoadRunner would you use to play Back the script in multi user mode?** - The Controller component is used to playback the script in multi-user mode. This is done during a scenario run where a vuser script is executed by a number of vusers in a group.
  9. **What is a rendezvous point?** - You insert rendezvous points into Vuser scripts to emulate heavy user load on the server. Rendezvous points instruct Vusers to wait during test execution for multiple Vusers to arrive at a certain point, in order that they may simultaneously perform a task. For example, to emulate peak load on the bank server, you can insert a rendezvous point instructing 100 Vusers to deposit cash into their accounts at the same time.
  10. **What is a scenario?** - A scenario defines the events that occur during each testing session. For example, a scenario defines and controls the number of users to emulate, the actions to be performed, and the machines on which the virtual users run their emulations.
  11. **Explain the recording mode for web Vuser script?** - We use VuGen to develop a Vuser script by recording a user performing typical business processes on a client application. VuGen creates the script by recording the activity between the client and the server. For example, in web based applications, VuGen monitors the client end of the database and traces all the requests sent to, and received from, the database server. We use VuGen to: Monitor the communication between the application and the server; Generate the required function calls; and Insert the generated function calls into a Vuser script.
  12. **Why do you create parameters?** - Parameters are like script variables. They are used to vary input to the server and to emulate real users. Different sets of data are sent to the server each time the script is run. Better simulate the usage model for more accurate testing from the Controller; one script can emulate many different users on the system.
  13. **What is correlation? Explain the difference between automatic correlation and manual correlation?** - Correlation is used to obtain data which are unique for each run of the script and which are generated by nested queries. Correlation provides the value to avoid errors arising out of duplicate values and also optimizing the code (to avoid nested queries). Automatic correlation is where we set some rules for correlation. It can be application server specific. Here values are replaced by data which are created by these rules. In manual correlation, the value we want to correlate is scanned and create correlation is used to correlate.
  14. **How do you find out where correlation is required? Give few examples from your projects?** - Two ways: First we can scan for correlations, and see the list of
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- values which can be correlated. From this we can pick a value to be correlated. Secondly, we can record two scripts and compare them. We can look up the difference file to see for the values which needed to be correlated. In my project, there was a unique id developed for each customer, it was nothing but Insurance Number, it was generated automatically and it was sequential and this value was unique. I had to correlate this value, in order to avoid errors while running my script. I did using scan for correlation.
15. **Where do you set automatic correlation options?** - Automatic correlation from web point of view can be set in recording options and correlation tab. Here we can enable correlation for the entire script and choose either issue online messages or offline actions, where we can define rules for that correlation. Automatic correlation for database can be done using show output window and scan for correlation and picking the correlate query tab and choose which query value we want to correlate. If we know the specific value to be correlated, we just do create correlation for the value and specify how the value to be created.
16. **What is a function to capture dynamic values in the web Vuser script?** - Web\_reg\_save\_param function saves dynamic data information to a parameter.
17. **When do you disable log in Virtual User Generator, When do you choose standard and extended logs?** - Once we debug our script and verify that it is functional, we can enable logging for errors only. When we add a script to a scenario, logging is automatically disabled. Standard Log Option: When you select Standard log, it creates a standard log of functions and messages sent during script execution to use for debugging. Disable this option for large load testing scenarios. When you copy a script to a scenario, logging is automatically disabled Extended Log Option: Select extended log to create an extended log, including warnings and other messages. Disable this option for large load testing scenarios. When you copy a script to a scenario, logging is automatically disabled. We can specify which additional information should be added to the extended log using the Extended log options.
18. **How do you debug a LoadRunner script?** - VuGen contains two options to help debug Vuser scripts-the Run Step by Step command and breakpoints. The Debug settings in the Options dialog box allow us to determine the extent of the trace to be performed during scenario execution. The debug information is written to the Output window. We can manually set the message class within your script using the lr\_set\_debug\_message function. This is useful if we want to receive debug information about a small section of the script only.
19. **How do you write user defined functions in LR? Give me few functions you wrote in your previous project?** - Before we create the User Defined functions we need to create the external library (DLL) with the function. We add this library to VuGen bin directory. Once the library is added then we assign user defined function as a parameter. The function should have the following format: \_\_declspec (dllexport) char\* <function name>(char\*, char\*)Examples of user defined functions are as follows:GetVersion, GetCurrentTime, GetPltform are some of the user defined functions used in my earlier project.
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20. **What are the changes you can make in run-time settings?** - The Run Time Settings that we make are: a) **Pacing** - It has iteration count. b) **Log** - Under this we have Disable Logging Standard Log and c) **Extended Think Time** - In think time we have two options like Ignore think time and Replay think time. d) **General** - Under general tab we can set the Vusers as process or as multithreading and whether each step as a transaction.
  21. **Where do you set Iteration for Vuser testing?** - We set Iterations in the Run Time Settings of the VuGen. The navigation for this is Run time settings, Pacing tab, set number of iterations.
  22. **How do you perform functional testing under load?** - Functionality under load can be tested by running several Vusers concurrently. By increasing the amount of Vusers, we can determine how much load the server can sustain.
  23. **What is Ramp up? How do you set this?** - This option is used to gradually increase the amount of Vusers/load on the server. An initial value is set and a value to wait between intervals can be specified. To set Ramp Up, go to 'Scenario Scheduling Options'
  24. **What is the advantage of running the Vuser as thread?** - VuGen provides the facility to use multithreading. This enables more Vusers to be run per generator. If the Vuser is run as a process, the same driver program is loaded into memory for each Vuser, thus taking up a large amount of memory. This limits the number of Vusers that can be run on a single generator. If the Vuser is run as a thread, only one instance of the driver program is loaded into memory for the given number of Vusers (say 100). Each thread shares the memory of the parent driver program, thus enabling more Vusers to be run per generator.
  25. **If you want to stop the execution of your script on error, how do you do that?**  
- The **lr\_abort** function aborts the execution of a Vuser script. It instructs the Vuser to stop executing the Actions section, execute the vuser\_end section and end the execution. This function is useful when you need to manually abort a script execution as a result of a specific error condition. When you end a script using this function, the Vuser is assigned the status "Stopped". For this to take effect, we have to first uncheck the "Continue on error" option in Run-Time Settings.
  26. **What is the relation between Response Time and Throughput?** - The Throughput graph shows the amount of data in bytes that the Vusers received from the server in a second. When we compare this with the transaction response time, we will notice that as throughput decreased, the response time also decreased. Similarly, the peak throughput and highest response time would occur approximately at the same time.
  27. **Explain the Configuration of your systems?** - The configuration of our systems refers to that of the client machines on which we run the Vusers. The configuration of any client machine includes its hardware settings, memory, operating system, software applications, development tools, etc. This system component configuration should match with the overall system configuration that would include the network infrastructure, the web server, the database server, and any other components that go with this larger system so as to achieve the load testing objectives.
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28. **How do you identify the performance bottlenecks?** - Performance Bottlenecks can be detected by using monitors. These monitors might be application server monitors, web server monitors, database server monitors and network monitors. They help in finding out the troubled area in our scenario which causes increased response time. The measurements made are usually performance response time, throughput, hits/sec, network delay graphs, etc.
29. **If web server, database and Network are all fine where could be the problem?**  
- The problem could be in the system itself or in the application server or in the code written for the application.
30. **How did you find web server related issues?** - Using Web resource monitors we can find the performance of web servers. Using these monitors we can analyze throughput on the web server, number of hits per second that occurred during scenario, the number of http responses per second, the number of downloaded pages per second.
31. **How did you find database related issues?** - By running “Database” monitor and help of “Data Resource Graph” we can find database related issues. E.g. You can specify the resource you want to measure on before running the controller and than you can see database related issues
32. **Explain all the web recording options?**
33. **What is the difference between Overlay graph and Correlate graph?** -  
**Overlay Graph:** It overlay the content of two graphs that shares a common x-axis. Left Y-axis on the merged graph show's the current graph's value & Right Y-axis show the value of Y-axis of the graph that was merged. **Correlate Graph:** Plot the Y-axis of two graphs against each other. The active graph's Y-axis becomes X-axis of merged graph. Y-axis of the graph that was merged becomes merged graph's Y-axis.
34. **How did you plan the Load? What are the Criteria?** - Load test is planned to decide the number of users, what kind of machines we are going to use and from where they are run. It is based on 2 important documents, Task Distribution Diagram and Transaction profile. Task Distribution Diagram gives us the information on number of users for a particular transaction and the time of the load. The peak usage and off-usage are decided from this Diagram. Transaction profile gives us the information about the transactions name and their priority levels with regard to the scenario we are deciding.
35. **What does vuser\_init action contain?** - Vuser\_init action contains procedures to login to a server.
36. **What does vuser\_end action contain?** - Vuser\_end section contains log off procedures.
37. **What is think time? How do you change the threshold?** - Think time is the time that a real user waits between actions. Example: When a user receives data from a server, the user may wait several seconds to review the data before responding. This delay is known as the think time. Changing the Threshold: Threshold level is the level below which the recorded think time will be ignored. The default value is five (5) seconds. We can change the think time threshold in the Recording options of the Vugen.
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38. **What is the difference between standard log and extended log?** - The standard log sends a subset of functions and messages sent during script execution to a log. The subset depends on the Vuser type. Extended log sends a detailed script execution messages to the output log. This is mainly used during debugging when we want information about: Parameter substitution. Data returned by the server. Advanced trace.
39. **Explain the following functions:** - **lr\_debug\_message** - The lr\_debug\_message function sends a debug message to the output log when the specified message class is set. **lr\_output\_message** - The lr\_output\_message function sends notifications to the Controller Output window and the Vuser log file. **lr\_error\_message** - The lr\_error\_message function sends an error message to the LoadRunner Output window. **lrd\_stmt** - The lrd\_stmt function associates a character string (usually a SQL statement) with a cursor. This function sets a SQL statement to be processed. **lrd\_fetch** - The lrd\_fetch function fetches the next row from the result set.
40. **Throughput** - **If the throughput scales upward as time progresses and the number of Vusers increase, this indicates that the bandwidth is sufficient.** If the graph were to remain relatively flat as the number of Vusers increased, it would be reasonable to conclude that the bandwidth is constraining the volume of data delivered.
41. **Types of Goals in Goal-Oriented Scenario** - Load Runner provides you with five different types of goals in a goal oriented scenario:
- The number of concurrent Vusers
  - The number of hits per second
  - The number of transactions per second
  - The number of pages per minute
  - The transaction response time that you want your scenario
42. **Analysis Scenario (Bottlenecks):** In Running Vuser graph correlated with the response time graph you can see that as the number of Vusers increases, the average response time of the check itinerary transaction very gradually increases. In other words, the average response time steadily increases as the load increases. At 56 Vusers, there is a sudden, sharp increase in the average response time. We say that the test *broke the server*. **That is the mean time before failure (MTBF)**. The response time clearly began to degrade when there were more than 56 Vusers running simultaneously.
43. **What is correlation? Explain the difference between automatic correlation and manual correlation?** - Correlation is used to obtain data which are unique for each run of the script and which are generated by nested queries. Correlation provides the value to avoid errors arising out of duplicate values and also optimizing the code (to avoid nested queries). Automatic correlation is where we set some rules for correlation. It can be application server specific. Here values are replaced by data which are created by these rules. In manual correlation, the value we want to correlate is scanned and create correlation is used to correlate.
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