

Putting the Right Stress into WMS Volume Testing

Eliminate unwelcome surprises.

When implementing or upgrading a Warehouse Management System (WMS) in a high volume environment, it should be a given that a significant amount of effort needs to be dedicated to various phases of testing. However, a common mistake is to ignore or improperly plan for volume testing. So what types of processes should be tested?

There is unit testing that validates segments of functionality, interface testing that checks the flow of data between systems, user acceptance testing that involves the end user group working through scripted functional flows, and field testing that executes an augmented version of the user acceptance testing on the distribution center floor.

Volume testing, also known as stress testing, is an assessment that may be ignored. This is a mistake, because this puts a strain on the processes within the WMS, as well as its interfaces in order to identify conditions that would result in a slow-down or catastrophic crash of the system. This will tell you the upper bound of the system and if that limit is acceptable for your business demands.

So what types of processes should be tested? The following list covers many of the more common areas:

RF Floor Transactions - This should involve the more commonly used RF transactions such as putaway and picking. It is not a good idea to include every type of RF activity. That means you probably will not be paying too much attention to cycle counts as a part of your stress test.

Wave Processing - It is absolutely necessary to know how long it will take to process each day's orders. In addition, it is important to validate if there are any important processes that cannot be executed during wave processing. For example, the testing may reveal that RF unit picking is an activity that cannot be performed without database locks or significant delays when orders are being allocated in the wave.

Host Interface Processes - It is important to ensure that receipt files, orders, and item master information can be downloaded from the host and that it simulates normal daily



Understanding why a WMS needs volume testing and what should be tested are really the easy parts. The more challenging part is developing an approach for how the volume tests will be executed. There are two approaches. One is to use a software application that simulates load and the second is to execute a manual load test with several users working in concert.

activity. The upload of receipt confirmations, inventory adjustments, order confirmation, and trailer information should be checked as well, but upload delays are not usually as detrimental to the operations team.

MHE/WCS Interfaces - The key aspect of MHE or WCS interfacing is to ensure that heavy volumes in other areas, such as wave processing or RF picking, do not adversely affect it. Delays in the exchange of data between the WMS and the conveyor can result in a flood of cartons at the no-read or reject lines.

Report Execution - Poorly written reports can significantly weigh down a system and adversely impact users on the floor. It is important to ensure that any database indexes added to improve report execution or wave run do not slow down the RF transactions.

There are several software tools that can simulate load on the system and measure system response. These systems are great for

identifying volume thresholds where response time begins to suffer. However, the purchase cost of a typical load application system can be prohibitive. Also, some systems are more complex than others in terms of setup and use.

The alternative to load application software is to use several dozen users working from independent workstations. Obviously, the software purchase cost is eliminated, but there is a significant amount of coordination required and the ability to ramp up volume in a controlled manner can be very challenging. In addition, the ability to diagnose issues is also drastically diminished. One other disadvantage of the manual method is that it is far more difficult to repeat for further testing when compared to the automated software tools.

The final component to plan for is the timing of the volume test. Obviously, the earlier the test is executed the better. However, this requires a stable system in an environment

that closely mirrors production in terms of database size, hardware, and populated transactional data. Issues identified as a result of volume testing are not usually corrected as rapidly as configuration errors or system bugs.

If volume testing is executed too close to go-live and problems are found, then the project team should be prepared for a delayed implementation. Otherwise, operational or system alternatives that mitigate the volume issues in the short term will have to be used.

No one likes surprises when it comes to a WMS installation. The goal of WMS testing in general is to ensure that the system works as desired and that all issues are revealed. A failure to properly test volume can result in an unwelcomed surprise. The morning of go-live is not the time to find out that wave processing requires six hours of system time or that receipt ASNs cannot download from the host in a timely manner for the day to start. By executing the needed volume tests at the right time, you can properly mitigate any performance issues that may exist in a WMS.

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